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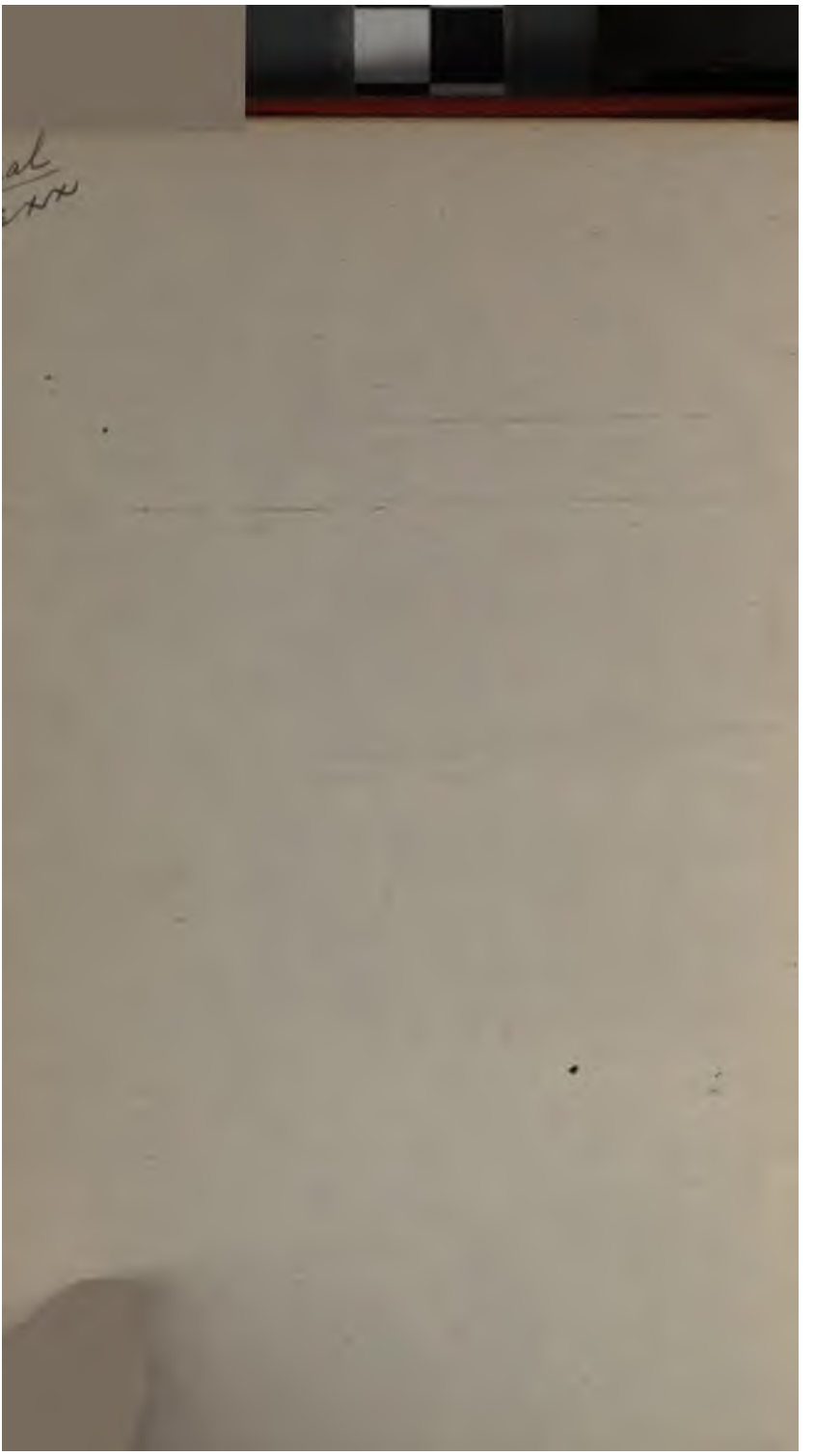

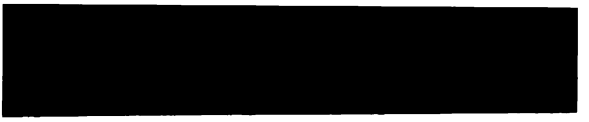

TREATMENT OF DISEASE IN CHILDREN.

TREATMENT OF DISEASE IN CHILDREN

INCLUDING THE

OUTLINES OF DIAGNOSIS AND THE CHIEF PATHOLOGICAL DIFFERENCES BETWEEN CHILDREN AND ADULTS.

BY

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TO

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AND TO THE NATIONAL HOSPITAL FOR PARALYSIS AND EPILEPSY,

THIS WORK IS, BY PERMISSION,

DEDICATED,

AS A TOKEN OF GRATITUDE, ESTEEM, AND ADMIRATION,

BY

THE AUTHOR.

PREFACE.

It has been my endeavour to prepare for the senior student and practitioner a concise but complete manual of the treatment of disease in children. I have made one assumption: that the reader is already acquainted with a work on general medicine. I should like to have reflected a picture of all contemporary treatment of disease in children. This was my original intention. But the material accumulated apace; and a volume of vast dimensions would have been required. Instead I have endeavoured to give what I thought best: to present a co-ordinate microcosm for the inco-ordinate chaos. All through the book I have emphasized that treatment I am accustomed to adopt.

The Alpha and Omega of all rational treatment is precise Diagnosis. It is rare that in treatment our indiscretion serveth us better than our judgment. The outlines of Diagnosis are given, but Diagnosis is a matter of practical clinical skill and sagacity hardly to be acquired from books.

Most difficult is it to state completely all the pathological differences between children and adults. Without occupying space unduly I have tried to incorporate in this work the chief differences. It will be gathered that a work which is one of Lewis's practical series cannot pretend to be of encyclopædic extent. But I confidently hope that the present

volume will be found to contain in a handy form an amount of material of a character which the student or practitioner will find of much value in his everyday professional life. I have not been content with emphatic assertions to the effect that this "must be" and that "should be," but I have also tried to give the why and wherefore, and these wherever possible, in physiological and anatomical terms.

THE AUTHOR.

24, Harley Street, Cavendish Square, W.
April, 1887.

INTRODUCTORY.

In medicine, as in the universe, all things are relative. The dissimilarities between the physiology and pathology of children and adults are differences in degree. Doubtless these differences in degree may be explained as the effect of unfinished growth and development of all parts, but especially of the nervous system, heart, and respiratory apparatus.

Irritability, irregularity and variability are notions never to be absent from the mind in thinking of children and their diseases.

There is a natural tendency in the mind to erect everything into a standard, type, or test. We do this in pathology, and expect diseases to conform to the standard or type. Disease and health in infancy and childhood are very erratic, and refuse, often in a tantalizing way, to be put into the harness of a type or standard. It is the unexpected that happens in infantile physio-pathology. Perhaps this noncomformity of disease and health to the type or test is *the* most striking characteristic of children, and especially infants. A dissimilarity between adults and children is always intensified, the younger is the infant.

The above generalities may be illustrated by reference to the particular case of the child's circulatory apparatus.

The heart is smaller in infants; its first sound is less long

and less loud; it is more irritable, irregular and variable, as the effect of any new condition in the infant's internal or external environment readily demonstrates; it refuses to be bound down by the standard set up for it—its apex beat is variable in force and position, and may, without disease, be found beating a larger or smaller area of the chest wall either in the usual place or in the fourth space and in the nipple line. The pulse follows the heart in its erraticalness, and also possesses an irregularity of its own, in addition to the mere physical and nervous conditions rendering its investigation difficult. An irregular pulse developing in any acute affection is of less diagnostic import in an infant than in an adult. It is a mistake, still committed by writers on children's diseases, to suppose that an irregular pulse specially points to brain disease, and generally meningitis. Alone as an isolated symptom, it is of no diagnostic value whatever. Here is again an illustration of nonconformity to type.

Further, the arterial tension is not steady in childhood. Sphygmographic and digital observations attest the variability and sudden changes in this phenomenon, especially in disease. Sudden temporary failure of the myocardium, both in the midst of apparent health and in the course of disease, is of greater frequency in children than adults: witness the state of the circulation and heart in scarlatina and diphtheria.

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TREATMENT OF DISEASE IN CHILDREN.

CHAPTER I.

GENERAL TREATMENT OF DISEASE.

THE fundamental principles of therapeutics in childhood are those of prevention, hygiene, and expectancy. Drugs should be avoided wherever possible. Depletion, antiphlogistics, and sedatives are used sparingly and with considerable caution. Under depletion must be included powerful purging, sweating, and vomiting.

Venæsection, almost impossible in infancy, should as a rule never be practised in childhood. We do not now employ venæsection in convulsions, coma, or inflammation. Leeches may be used carefully in sthenic morbid processes occurring in robust children. The number should be according to the desired effect. Three to five at once is a usual number for local depletion in inflammation. Each leech draws about two drams of blood. The leech should, whenever possible, be got to bite over a hard background, so that compression, if needed, may stop the bleeding at once. The doctor should do the leeching himself. Daytime is preferable to night. Behind the ears or on the top of the head, below the scapulæ, on the manubrium, and about the anus or in the groin are usual situations. The leeching should hardly ever be done in the presence of collapse or tendency to syncope. Great care should be taken

even in using a few leeches. They should only be used when there is what physiologists call "reaction"—when the skin is hot and suffused, the head burning, and the fontanelle full with high fever. Repeated leeching is most injudicious practice.

Mercury and tartar emetic, systematically used, for acute sthenic diseases will not be found figuring largely in modern physicians' prescriptions.

Opium is a most valuable sedative in childhood, and is freely but discriminately used. Children are very susceptible to its action. It should only be used when absolutely necessary. Under many circumstances bromides and chloral may be substituted, but even these sedatives require caution, for they lower cardiac activity and depress thermogenesis. Occasionally the subcutaneous injection of morphia, done with due caution, may with advantage replace the administration of opium by the mouth.

Blisters must be used with circumspection in childhood, for vesication results more rapidly, ulceration is more prone to occur, and constitutional disturbance, restlessness from irritation, is greater the younger the child. Blistering fluid is safest. The good effects may often be obtained without causing vesication.

It is important to **treat the child** and not the disease. This applies as much to trivial as to severe illness. I cannot speak too strongly of the importance of treating the cerebral cortex or chief organ of mind in children. We may be laughed at when the instruction is given to make food and medicines palatable, but if the mocker would only bear in mind a little physiology, the reason will be seen to be all on our side. Contemplate for a moment the nervous apparatus of the mouth. Look at the vast number of stimulant sensations (sweet, bitter, salt, sour, hot, warm, pungent, acrid, nauseous, cold, &c.). All of these imply

impressions on cerebral cortex as well as medulla, and possibly other centres for reflex secretion. If these sensations be of the disagreeable sort, we may presume that the lower medullary, as well as higher cerebral, centres are not acting happily. The best action is assumed to be that which is attended with the most lasting agreeable sensations. These considerations are rendered all the more important when we consider that the stomach and other abdominal viscera sympathize with the state of the upper parts of the alimentary apparatus. In trivial ailments children are often wayward and wilful, and so the doctor must yield to their mental condition. All medicines should be as palatable as possible, and the dose should be of diminutive proportions.

As a practical illustration of these principles I append this formula for a tasteless tincture of iron:—

℞ Liq. Ferri Chloridi U.S.P., ℥iv.
Citric Acid, gr. 2100.
Bicarbonate of Soda, gr. 2270.
Alcohol, ℥iv.
Aquam ad, ℥xvi.

The citric acid is dissolved in ℥iv. of water, and then heated to the boiling point; the bicarbonate is gradually added. The solution of iron is added when the effervescence has ceased. The mixture is then cooled. Water is added to ℥xii., and finally the alcohol. Each dram contains 7½ grains of dry ferric chloride. A half-dram would be suitable for a child two years old.

In severe illness the cerebral cortex or intellect offers less resistance to treatment, but care should be taken that the nervous functions, heart, and respiration do not falter and fail.

Stimulants are required in childhood in acute and chronic disease, but they are to be given with discretion, and in as small quantities as possible to effect the purpose in view.

Thirst should be abated by iced drinks or ice wherever

possible ; as a rule, much drinking is to be avoided ; lemonade and orangeade, made with fresh lemons and oranges, may be given in small doses frequently.

Children tolerate well the following drugs :—belladonna, arsenic, strychnia, iron, ipecacuanha, alcohol, and even dilute prussic acid. Active principles, now so easily obtained, are preferable to large doses of crude drugs. Granules or parvules, not homœopathic, of powerful alkaloids and glucosides may be conveniently used in infancy and childhood. The little pellet is neatly dropped into the region of the deglutition reflex. It is useful to remember that ointments of quinine may be infricted into the soft skin of groin or axilla, and also that pills may be easily inserted into the rectum.

The healthy existence of any organism is dependent on the concurrence of a certain set of conditions. We are often warned of the baneful influence of drugs in general, and of certain forms of regimen in particular. But there is another aspect of this question. I make bold to say that there exist organisms whose healthy life is promoted, and the term of whose life is extended, by the employment of drugs ; in other words, by the introduction of some condition not usually required by the majority of organisms. It is incontestable that some individuals are only maintained in a state of health by the frequent or constant bathing of their nervous tissues with bromide. And the same holds good of certain gouty patients, for whom repeated courses of alkaline treatment bring increased capacity for work and prolonged lease of life. Many women at the grand climacteric period have their lives rendered more happy and more useful, and I even believe extended, by the introduction three times a day into the organism of small doses of alkalies and bitters. The meaning of all this is that our views as to what constitutes Nature require modification as civilization advances from age

to age. It is heard not unfrequently that treatment by drugs is unnatural. "It cannot be good to take so much medicine" is a vulgar cry. Now what is Nature? Nature is organized accident. She is stereotyped art. But we must not forget the artificial foundation of Nature.

The instruction is pretty general in text books on medicine that the General or Constitutional Health should be attended to. This instruction comprises a great deal. It means that the best measures to promote the healthy performance of every function of the body are to be adopted—not the health of the nervous and muscular apparatus alone, but also that of the digestive, respiratory, circulatory, and excretory systems. Surely a very large order, a very general instruction. The dimensions of the instruction are still further increased when it is remembered that, as a rule, no one of the systems of which the body is composed can be kept healthy unless all the others are also doing their work adequately. Again, the measures to be adopted for the promotion of the health of any system are not always the same in every individual case. Some measures that act as stimulants in one individual might prove depressants in another. This principle is of special application in children.

Under the heading of Personal Hygiene is included all measures and means designed to promote the health of the neuromuscular apparatus, the digestive organs, and the total excretory system—lungs, liver, bowels, skin and kidneys. Excretion by the lungs is interfered with in an overcrowded room, for diffusion and escape of gases from the pulmonary blood-surface is impeded.

Muscular exercise in the open air raises blood pressure, dilates cutaneous vessels, and, therefore, promotes cutaneous and renal excretion. Further, the arterial circulation being improved, the abdominal vessels are emptied; there is less tendency to stagnation in the valveless portal system. The

action of the abdominal muscles, too, is to force blood through the portal veins into the liver, and on to the heart. The respirations are also increased in number and depth, with consequent more efficient discharge of expired air, and increased circulation in the pulmonary vessels.

A definite amount of sleep is necessary in order that the nervous energy spent during waking may be restored. Some organisms can perform this ascending metabolism in a shorter space of time than others; but most children require long sleeps. Oxygen is most requisite for this building up of nervous energy, and, therefore, pure air in the sleeping rooms must be provided. It is more than probable that excess of carbonic acid, and of the impurities thrown off in respiration, prevent the proper restoration of nervous force; so that, even though the oxygen be not defective in quantity in the air of the sleeping chamber, still there should not be any excess of the products of respiration. Moreover, whilst the organism is sleeping, the forces of resistance to disease are lowered; there is a diurnal variation in the temperature and in the vitality of the body.

Dampness of residence acts injuriously in three ways at least. It causes more loss of heat by radiation from the surface of the body, and, therefore, excessive expenditure of energy—a thing to be avoided even in the most healthy. Again, damp walls prevent proper ventilation. Normal ventilation of residences takes place through porous walls, as well as through actual crevices, doors and windows. Further, it has been shown that damp walls are favourable soil for the growth of bacteria, and probably of pathogenic organisms. Humidity is decidedly a predisposing cause of some causes of disease, as well as a depressor of general body health. Its influence in the promotion of phthisis is incontestably established.

Clothing in health and disease.—The surface is so soon

chilled in infants that great pains should be taken to protect every square inch against transient changes of temperature. The amount of clothing must vary with the temperature of the environment. The cutaneous area should yield a certain amount of heat in a certain space of time. To sudden demands for more we should make objection. The long clothes of the new-born are unscientific and unreliable. The great mortality in the first year of life is partly produced by the absurd fashion of dressing. The neck and arms and hands of the new-born must be covered. The belly, buttocks, thighs, and legs of older children must be protected. The best material is animal wool (Jäger or Osterode). Flannel of good quality and texture is not thereby condemned. There is no scientific reason for keeping the belly bound down and tightly covered. Napkins are a necessary nuisance in babies. It is impossible to avoid accidents during the first year. But a combination garment of wool or flannel, with long sleeves and gaiters, gloves and socks, seems to me the fitting raiment for all children.

By a simple arrangement of buttons or strings or ribbons —a few safety pins are alone admissible—this combination could be taken off and put on without trouble. Drawers made in two pieces so that they may not become wet or soiled are now in use for children wearing diapers.

The night dress should be a simple sack, with sleeves but no legs; a draw-string at the bottom seals the sack, and prevents exposure of feet and legs. This may be made of wool for winter, and of linen for summer wear. A thin flannel vest should be worn at night in addition, and this should cover the surface of chest and back and belly. Night clothes are worn only at night. The clothing must be changed frequently enough to keep it sweet and clean. Extra clothing for outdoor use should not be donned till necessary, and should be doffed immediately on return.

Shoes must be easy-fitting, to allow of the free play of the foot, but not loose enough to hamper the gait.

For premature infants or collapsed ones a uniform coating or artificial skin of cotton wadding is best, and should be applied everywhere, except over the orifices of the body. The mechanical nurse or couveuse* is an excellent apparatus.

Warmth, at all costs, must be obtained for cases of palsy or defective circulation. This may be secured by worsted stockings of double thickness, by quilting two together; or these lined with cotton wool, or with heated bran or camomile flowers. Hot bottles *near*, but not in contact with, the limbs may be required.

In cases of eczema and raw surfaces, cold and wet and air must be excluded by ointment and lint, or by soluble varnishes.

Diarrhœas always therapeutically demand a uniform temperature of the belly to prevent peristalsis and increased intestinal secretion. Rest in bed fulfils most requirements. But swathing the belly in flannel, or cotton wool and flannel, goes more directly to the point.

Fresh air.—A vitiated atmosphere would cause certain death to infants by protracted poisoning. An hour of it must deteriorate vitality. Vitiation is due to organic emanations rather than to defect of oxygen and excess of carbonic acid. These organic excreta are allied to the fatty acids. The clothes of anyone are saturated with such products, and furniture and fomites absorb them and give them off. Disinfection and cleansing of furniture and clothing are, therefore, scientifically justified. Bad air may *lower* vitality, or *pervert* it, and induce positive disease. Infinitely great is the number of ways an atmosphere may become vitiated.

Conspicuous by its absence is ventilation in many nurseries. I have entered the "nursery" of good houses. Many such

* Hearson's patent, Regent Street.

nurseries breed disease, not children. Mildly put, let me say that air closely confined within the curtains of the bassinette, and malodorous with soiled napkin, must be highly prejudicial to the depuration and oxygenation of the infant's blood.

Temperature, chemical composition, and hygrometry, are a trinity of necessities. Our aim should be to provide an atmosphere not too cold, nor too moist, nor too warm, nor too dry, but just warm enough, and just dry enough. Dirt, too, is a great enemy, and filtration of air highly desirable. In chest disease respirators should be worn over mouth and nose.

Cubic space.—A thousand cubic feet per head is not too much for the nursery, and then ventilation is necessary. Trust cannot be reposed in "natural" ventilation, in the winter at least. Raw materials, indeed, does nature supply in her most inclement moods.

The Temperature of the room should be about 60° F. Tobin's tubes are useful, and prevent some mechanical impurity of the air. A cheerful open fire is more agreeable than scientific. Unequal warming and variable currents of air are its objections. The modern stoves are safest and best, and most scientific. The air is heated before entrance. The necessary moisture is kept by means of a basin of water. A thermometer and hygrometer render exact information.

Gymnastics and exercise.—Great is the good gymnastics may effect in many diseases. Second only to exercise in the open air, it ranks high as a therapeutic agency. A little physiology puts it on a proper basis. But in practice system is everything. "Try gymnastics" is very good advice. But the thing is how, when, where. The exercises must be adapted to each individual case. Every carefully and neatly performed muscular act is a gymnastic exercise. Muscle is not alone acting. Nerve centres and paths come in for the training.

Blood and blood-vessel enjoy the education. Every action involves some neuromuscular apparatus, is attended by physiological nerve and muscle hyperæmia, physiological nerve discharge and muscular contraction. Each careful and neatly performed contraction means a definite co-ordinated nerve discharge. This is accompanied by an equally harmonious chemico-physical change in nerve and muscle. So the whole body benefits, for nerve, muscle, and circulation are actually, and excretion with assimilation indirectly, involved. The influence of habit is of immense importance. This applies everywhere in physiology and pathology. One disorderly movement is as bad as one orderly movement is good. A neatly and harmoniously performed mental or muscular act is a power for good. And conversely, clumsiness perpetuates itself.

The increased respiration and circulation, and augmented perspiration that attend muscular movements are of therapeutic benefit. But here I would deal only with the great good the nerve centres and muscles gain by harmonious perfectly co-ordinated muscular acts. This perfect performance must never be done to the point of prostration or fatigue. Palpitation, as a rule, interdicts gymnastics. Muscle and nerve may atrophy from excessive employment. Prostration or fatigue also act adversely on all other corporeal processes.

In nervous debility.—Feeble-minded, backward, choreic and neurotic children have their brains, cords, nerves, and muscles improved by instruction in calisthenics or gymnastics.

This gain is chiefly the result of the direct or special action of the exercises. To effect this the TRAINING, the neatness and perfection of the co-ordinate movements is most wanted.

In general debility.—Scrofulous, anæmic, feeble-bodied children reap benefit chiefly by the indirect or general action of gymnastics, by the increased circulation, respiration,

excretion, and secretion caused by the muscular movements. Under these circumstances co-ordinate movement, training, is of less value than the mere action or motion.

Methods.—Professors of calisthenics justly and properly exist. Deportment in standing, walking, and performing movements with ease and grace is an art. Nature is stereotyped art, but she is not always graceful, harmonious and artistic. The exercises must be taken as school lessons are or should be. Children may be cured of stammering by being taught *how* to breathe and *how* to articulate by a master of elocution. Wisdom is everything, knowledge of but little value. In performances of any kind the aim should be to do them as perfectly as possible. Bending the arm seems a simple act, but it may be performed well or ill.

The time occupied in these active exercises should be in proportion to the strength of the patient. Ten minutes may be enough. Repetition should be daily, or twice a day, or three times a week, according to circumstances and requirements. The room should not be dusty or ill ventilated. This is most important in lung affections. Deformities of chest are decidedly cases for calisthenics and special gymnastics. Some of the mechanical appliances at the Zander Institute may prove valuable. There are a thousand movements to practise, from simple to very complex. Here I do not treat of athletics, which are also to be regarded as gymnastics.

Flexions and extensions and rotations of joints and trunk should be deliberately performed; indeed, deliberation at the outset of learning is a necessary factor of success. The exercises are arranged to bring any group of muscles and corresponding nerve centres into action. Ordinary drilling is very good for the general effects of gymnastics. When the gymnastics are ordered for cases of palsy, special movements are practised. Attitude requires attention. One group of muscles acts better in one attitude of the body, another in another.

Taking deep breaths, standing at attention, throwing the shoulders back, bending the trunk forwards for the hands to touch the toes, neatly extending the arms from the trunks are useful movements. Important is the mode of execution—not too rapid, nor too forcible. The movement should be commenced well and quickly, but not abruptly ; and finished more gradually. Each movement should be repeated in the same time as the previous one. All these and other points are needed to educate the nervous centres and muscles up to the mark.

Counting and singing are excellent means for securing harmonious and regular action. Reading aloud and elocution, are valuable training for choreoid individuals as prophylactic and preventive of relapses. The brain, medulla, nerves, and muscles are thereby trained and better nourished.

Such apparatus as dumb-bells of proper weight, Indian clubs, trapeze, horizontal bar, parallel bars, go-cart, bicycle worked by hand-treadles or foot-treadles according as action of arms or legs is desired are sufficient for most cases.

The tendency for the constitution to alter, for diseases to disappear or appear about the age of seven and fourteen, is not imaginary. Great changes occur in the organism at these epochs. This widespread change often swamps local and general lesions in its universal commotion, or, on the other hand, may educe inadequacy in one or other part.

CHAPTER II.

THE PRINCIPLES AND PRACTICE OF FEEDING INFANTS AND CHILDREN.

Human milk is the type of infants' food.—All artificial foods should conform as closely as possible to this prototype. The resemblance must be not only a chemical, but also a physical one. The clotting in human milk results in fine flakes, and this should be obtained when artificial milk is given. The specific gravity of good human milk is about 1030. It contains rather less than four per cent. of proteids; rather more than two and a half per cent. of fat (hydrocarbon); and rather less than four and a half per cent. of sugar of milk (carbohydrate); about one and a half per cent. of salts, and about 88 per cent. of water. The proteid and carbohydrate are nearly the same in quantity in the infant's diet, whilst in the adult standard diet (Ranke) the proteid is to the carbohydrate as one is to three. The fat in the standard infant diet is relatively twice as much as in the standard adult diet. The most important salts in the milk are phosphates and chlorides, and chiefly those of potassium, sodium, magnesium, lime and iron. It may be remembered that the solids of the blood and tissues are richest in potash salts and phosphates, whilst there is a predominance of soda salts and chlorides in the fluids of the body. The mother's milk is the best.

The *digestive and assimilative* organs of infants are of more immediate importance in the economy than any other set of organs. The body has to build up rather than break down. No doubt the expenditure is large, but the income

must be much larger. The digestive organs have to prepare plenty of material for constructive purposes; the body grows very rapidly, and the brain nearly doubles itself in weight in seven years. The feeding is more frequent, and the bowels act rather more frequently in young infants. The liver is very large, relatively and absolutely, because its metabolic functions are very active, and the amount of material manufactured great. The caput cæcum coli is not developed; this is related doubtless to the efficiency of the peristaltic action and the frequency of action of the bowels, which prevents any fæcal accumulation and gaseous generation in the first part of the large bowel. The sigmoid flexure and rectum are thrown into folds as the result of a greater relative length of these parts of the bowel in infancy. Constipation is promoted by the presence of these twists and turns in the last part of the large bowel (see Prolapse of Bowel and Constipation).

The mother as a nurse.—It is good for the mother to nurse her offspring, for suckling favours the involution of the uterus. The infant should be put to the breast a few hours after parturition; this promotes uterine contraction for the mother and peristaltic action for the infant. The milk in the breast for the first two days is a thick yellowish fluid called colostrum. It acts as a natural and mild aperient. It contains a great number of large corpuscles filled with fatty globules—the "colostrum corpuscles." There being nothing but colostrum for two days, it follows that artificial feeding of the newborn with gruel, butter, sugar, and the like, is utterly condemned by Nature herself. An absence of secretion on the third day should be an indication to give the infant milk and barley water, one part to two, sweetened with sugar of milk. The secretion of milk a day or so later is a sign to discontinue all artificial feeding. After the proper secretion of the milk has begun its physical characters change. It is a bluish

white fluid containing an abundance of minute spherical globules consisting of fat coated with casein or alkali albumen. A few colostrum corpuscles are also present, but these should not be found after the first month. An analysis of the mother's milk shows that it does not remain of uniform character. The amount of casein is small during the first month, but it increases during the next month or two, and then remains constant. The salts also increase in quantity for a month or so. The lactine, however, is in greatest abundance during the first two months, and diminishes somewhat afterwards. The amount of fat varies considerably from time to time, and this variation is probably due to alterations in the quantity and quality of the mother's diet. The *influence of menstruation and of a fresh pregnancy* on the milk is a matter requiring further elucidation, but as a rule the occurrence of either event should be regarded as an indication for weaning the child. The quantity and the quality of the milk varies at different times in the same mother, and there are also considerable differences in the milk in different individuals. Signs of exhaustion in the mother are indications for reducing the number of daily nursings or for suspending them entirely. If there be an excessive flow of watery milk *(galactorrhœa)* during the first few weeks of suckling it is a sign that the mother is unfit to suckle her offspring, and a discontinuance of the nursing is to be advised. Even when the mother is willing to suckle her offspring the milk may be insufficient in quantity or defective in quality. If merely insufficient in quantity the child should have what there is. And the quantity may often be increased by the mother's taking a cup of milk or gruel half an hour before suckling. Defective quality of the milk may not be so easily managed. This defect may be known by the child's not thriving, crying and not gaining weight. Or physical and microscopical and even chemical examination may be practised to ascertain the

nature of the defect. The diet of the mother should be inquired into. The food of the mother should be abundant, of simple kind, and nutritious. It should be taken at regular intervals. Highly spiced, smoked or cured, rich or stimulating articles of diet should be avoided. Beer as a rule does not make good milk, but a little stout is a great help to some women.

Fresh air is as necessary for the mother as for the infant. The maternal alvine evacuations should be absolutely regular. I find that oatmeal porridge for breakfast corrects a liability to constipation not only in the mother, but also indirectly in the infant. Daily exercise in the park promotes a healthy state of the lacteal secretion. Attention should be given to the dentistry. Carious teeth should have the dentist's advice and attention. The mother's breath should be sweet.

Anything calculated to excite or depress the nervous system of the mother should be sedulously shunned. Mental emotion is said so to have altered the character of the milk that serious disturbance of the child's health has resulted, and convulsions, nay, even death, have been attributed to this cause. The mother should have a sufficient amount of sleep every night, and the feeding should be so arranged as not to deprive her of a continuous sleep of at least six hours. This rule is often broken during the first month with advantage to the child, the mother often seeming inclined to wake in the middle of the night, and this without there being any cause for anxiety.

Certain local conditions of the breast may interfere with the proper performance of lactation. Depression of the nipple may usually be overcome with perseverance. The nipples should receive attention during the last months of pregnancy. They may be drawn out with the thumb and finger, or the common breast pump may be called into requisition. If the nipples be tender they should be hardened by

the use of evaporating lotions composed of equal parts of brandy or rectified spirit and water. Excoriated and fissured nipples require much attention. They may cause serious interference with lactation. The best method of treating them is to apply the solid stick of nitrate of silver to every part of their surface and to every crevice and corner. This coats the surface of the sore with albuminate, and thus forms a protection from the atmosphere. At the same time the caustic cleans the impurities from the surface, and by its stimulant character promotes the healing of the sore. If the fissure or excoriation be very slight a metal or glass breast-shield may enable the child to suck the milk without causing the mother much discomfort. But as a rule the pain of these apparently trivial cracks is great, and the possibility of irritation leading to the development of an abscess has to be borne in mind. One factor in the causation of an abscess is the tension due to unescaped milk.

If the mother be suffering from marked *phthisis* the baby should be brought up by hand. The milk is frequently of poor quality in phthinoids, and the suckling can but still further lower their vitality. Constitutional *syphilis* in the mother need not prevent her from nursing her infant. She should be treated with specifics, and it may be necessary to treat the baby directly also. But sometimes the mercury taken by the mother acts through the medium of the milk on the child. Should the mother's health be seriously lowered from any cause lactation should not be practised. The presence of *inflammatory disease* in the mother is, in my experience, also an indication for her not suckling the child, the milk being deficient in quantity and likely to be deteriorated in quality in these affections. The development of a mammary abscess in one breast is a contra-indication to nursing with that breast, which should be treated with glycerine of belladonna and fomentations, and surgical treatment, if necessary, sought.

Erysipelas also in the mother spoils the secretion of milk and renders what is secreted unwholesome.

Becquerel found that the fatty matter of the mother's milk was increased in quantity as the result of all acute and chronic diseases, with the exception of syphilis and advanced phthisis. Acute diseases are also characterized by an increase of casein, and chronic diseases by a remarkable diminution of casein.

Method and times of nursing.—Each breast should be used alternately; generally a healthy suckling practically empties a breast at a time. The infant should be supported on the same arm as the breast to be used. The mother should hold herself a little downwards, so that the nipple may be easily grasped. The breast should be steadied by index and middle finger of the free hand. Pressure on the gland may assist a feeble suckling. Pressure at the base of the nipple may moderate the flow when sucking is too vigorous; choking or vomiting announces this fact. During the first week or two the infant should be put to the breast every two hours from 4 a.m. to 10 p.m., leaving the mother six hours' good rest. Later on, and by gradual increase of the interval, the breast should be given every three hours by the end of the *second* month.

Thus the *habit* of *regular feeding* and *sleeping* is generally readily established.

No laws are hard and fast rules. Individual peculiarities occasionally exist even in the new-born. A few infants thrive well enough on less frequent feedings, and others on smaller doses at shorter intervals. Do what we will, a single meal in the middle of the night may be necessary. And these peculiarities in feeding may vary with the season of the year, and even from week to week. The meal taken at each nursing should be augmented as each day passes. This extra demand Nature meets by increased secretion of richer milk. Doubtless the sucking developes the function of lactation. As

a rule, at seven months other food may be given (see p. 29), and weaning should be gradually accomplished by the end of the tenth month. The interval of feeding may be increased to three hours and a half if possible. At ten months the rate of feeding should be every four hours.

The weaning may be best effected thus :—One meal only from the bottle for the first day of the weaning period, then two on the second day, and so forth. But a difficulty in getting the infant to take the bottle or spoon should be met by abrupt weaning. The smearing a little aloes on the breast is unnecessary.

If the mother's milk be not available, then a *wet nurse* should be obtained.

In the *selection of a wet nurse* an eye should be had mainly to the general health of the proposed wet nurse and her infant. She should be between twenty and twenty-five years of age, have previously had a child, a brunette, of strong constitution, never having had a serious illness, and always well nourished, with small mammæ that yield an abundant supply of milk. She should be procured about three months after the birth of her own child, for the milk is then likely to be of uniform quality. Menstruation should not have reappeared. We wait three months after the birth of the woman's child before selecting her as the wet nurse in order to ascertain whether there have been any signs of syphilis either in the parent or offspring. Moreover, we can then judge of the value of her milk by the condition of her infant, and the state of her own health is the more likely to be assured. Sometimes the milk of the wet nurse does not agree after a month or so has elapsed. This difficulty may be surmounted by some alteration in her diet. But it frequently indicates the need for another nurse. The diet and mode of life of the wet nurse should conform to the same principles as those laid down for the mother when nursing.

Cases are known in which wet-nursing proves a failure. Where the expense does not preclude its use *asses' milk* should be tried. It approximates in chemical composition to human milk, but contains rather less fat and proteid. *Goat's milk* is richer in proteids and fats than human milk; but children have been successfully reared on it. The reason why children thrive on these milks and not on cow's milk appears chiefly to depend on the different kind of clots that are formed as the result of the action of the gastric juice. Cow's milk clots, if not guarded by mucilaginous fluids, in putty-like or wet cheese-like masses. Goat's and asses' milk give a loose, more flocculent curd. The infant should be fed every two hours during the first month, and about every three hours during the succeeding months. *Vide infra*, p. 23. The strong flavour of goat's milk and the laxative property of asses' milk are generally destroyed by boiling. Too frequent feeding hampers the movements and chemical processes in the stomach and intestines, leads to irritability and screaming, and soon sets up actual catarrh.

But if neither asses' milk nor goat's milk be used, then *artificial human milk* should be tried as the next best substitute for the mother's milk. It requires more trouble than the poorer classes are able to bestow on its preparation, but a good nurse will manage to make it regularly.

Cow's milk contains about one-third more casein and one-third less sugar than human milk. The following is Frankland's method of preparation of artificial human milk:—"Allow one-third of a pint of new milk to stand twelve hours; remove the cream and mix it with two-thirds of a pint of perfectly fresh cow's milk. Take the blue milk from which the cream was removed and put a piece of rennet about an inch square (fluid rennet may be employed) into it. Keep the vessel containing it in a warm place until the milk is fully curdled, an operation requiring five to fifteen minutes, ac-

cording to the activity of the rennet, which should be removed as soon as the curdling commences, and put into an egg-cup for use on subsequent occasions, as it may be employed daily for a month or two. Break up the curd repeatedly, and carefully separate the whole of the whey, which should then be rapidly heated to boiling in a small tin pan placed over a spirit or gas lamp. During the heating a further quantity of casein, technically called "fleetings," separates and must be removed by straining through clean muslin. Now dissolve 110 grains of powdered sugar of milk in the hot whey and mix it with the two-thirds of a pint of new milk to which the cream from the other fluid has already been added as already described. The artificial milk should be used within twelve hours of its preparation, and it is almost needless to add that all the vessels employed in its manufacture and administration should be kept scrupulously clean."

If artificial human milk be not employed, then *diluted cow's milk* should be essayed; "one-third more casein and one-third less sugar" represents the chief chemical difference between cow's milk and human. This must be remembered in order to write prescriptions.

But chemistry alone will not do. Physics are also necessary in the scientific nursery. The clot of cow's milk is too compact and close. How is this remedied? (1) By mechanically preventing the particles of casein from running together so closely. (2) By chemically preventing coagulation.

This last method appears to me to be radically wrong. It would require so much alkali as to neutralize and paralyze the gastric juice. Lime water would have to be used of a quantity equal to one-third of the meal. Some use bicarbonate of soda, about a grain to each ounce, or five drops of the liquor calcis saccharatus. B.P. to each ounce.

Small doses of mucilage simply used mechanically.—The mechanical method is best, and barley water the most useful and easily obtained mucilaginous agent. But it must not be too thick. Two teaspoonfuls of Scotch or pearl barley to a pint of cold—previously boiled and filtered—water are boiled in a clean saucepan down to two-thirds of a pint. After straining through muslin the liquor may be used.

Gelatine or isinglass may be used. A square inch of the former or a corresponding amount of the latter may be soaked in cold water for three hours; then the mixture is put into an earthen vessel and the latter into boiling water till the gelatine is solved. A teaspoonful or more, according to the quantity of the meal, of the resulting jelly will serve the purpose.

Mellin's food, or other malted food, dissolved in hot water may be used with the same object. A teaspoonful will suffice for each meal. If the very starchy unmalted foods are used they should be boiled for several hours so as to make a mucilage. Mucilage of acacia or tragacanth is also recommended by some. A dram of either would be suitable for an ordinary meal. Barley water is the best and most useful. I use it not only for its mechanical property, but also as the diluent. In my experience few sickly infants have the power of digesting the cow's curd with ease and comfort. Simple hydration does not prevent the compact clotting.

Healthy children may be able to digest cow's milk simply diluted, without any attempt being made to prevent the casein from running together into a firm clot.

Very variable is the *quantity* of food mixture required at different months. Scientific data are still deficient. Twelve ounces is about right for the first week. The quantity may roughly be said to increase at the rate of four ounces each month. At the seventh month thirty-five to forty ounces is about a right quantity. Later as much as three pints may

be ingested in the twenty-four hours. The *times* of feeding should be as at the breast—every two hours night and day for the first week; every two hours from 4 a.m. to 10 p.m. for the rest of the month; then every two hours and a half for second month and every three hours for third month. The first meal should be at 4 a.m., and the last at 10 p.m.

[To lay down absolute rules is nonsensical and impossible. The quantities and methods given are average and very elastic. Size, mental and bodily activity, capacity for digestion, individual peculiarities are such variable factors. And each child must be considered as a concern in and of itself.]

Thus six hours' rest are secured for the mother. Some give the last meal later. I prefer it earlier because—though there are no scientific data—I believe that before the dead of night sleep is more refreshing. We are such stuff as dreams are made of. Some individuals cannot sleep except in the magnetic line. Small items may make great differences.

The following **Schema of Diet** is not inflexible.

First week.—Thin barley water and cow's milk, of each four drams; sugar of milk, fifteen grains; every two hours night and day.

Rest of first month.—Thin barley water, five drams; cow's milk, six drams, with fifteen grains of sugar. Meals every two hours from 4 a.m. to 10 p.m.

Second month.—Cow's milk, nine drams; barley water, six drams; water, three drams; cream, two drams; sugar of milk, twenty grains; every two hours and a half.

Third month.—Cow's milk, twelve drams; barley water, six drams; water, six drams; cream, three drams; sugar of milk, half a dram; every three hours.

Fourth month.—Cow's milk, sixteen drams; barley water, six drams; water, eight drams; cream, four drams; sugar of milk, forty-five grains; every three hours.

Fifth month.—Cow's milk, eighteen drams; barley water,

six drams; water, ten drams; cream, five drams; sugar of milk, one dram; every three hours.

Six month.—Cow's milk, twenty drams; barley water, six drams; water, ten drams; cream, five drams; sugar of milk one dram; every three hours.

The importance of aseptic cleanliness is truly tremendous. An eye is to be kept to the dairyman's utensils.

It is well to supply one's own milk cans, and see that they are kept for one's own use. In hot weather the milk should be boiled and kept in a refrigerator. The refrigerator is best kept outside the nursery, and not in a dusty place. The lid should always be kept down.

Lime water is useful for neutralizing acid cow's milk—slaked lime one ounce, and distilled water four pints. It must be kept carefully stoppered.

Cow's milk rapidly undergoes lactic acid fermentation. This acidity checks the secretion, and fermentation hinders the action, of the gastric juice. Hence all this cleanliness.

Condensed milk may have to be employed. If sweetened condensed milk be used, then half-a-teaspoonful to three tablespoonfuls are the usual proportions for the first week. This does not contain enough casein or fat, and so the addition of ten drops of cream is needed. Later one teaspoonful may be given in four or five tablespoonfuls of water. At the seventh month, a teaspoonful to two tablespoonfuls would be an average quantity. The quantity of fluid taken should be about the same as when diluted cow's milk is used; but cow's milk should be tried from time to time, in order to displace, if possible, the condensed milk. Happiness, and growth in size, and increase in weight are seen with condensed milk feeding; but there is too much fat formed, and the child is apathetic rather than comfortable and lively. A child brought up for seven months on condensed milk runs the risk of becoming scorbutic, or rickety, or both. The

sugar is often used to prevent constipation; but it fattens the child by laying hold of oxygen, instead of breaking down albumens.

If cow's milk cannot be borne by the infant, it is a good plan to let it have besides the dilute Swiss milk, or with it, a little white of egg or raw meat juice. Half-a-dram of either may be added to each or every other meal according to the powers of proteid digestion.

The raw meat juice may be expressed by a machine after mincing. A simple plan is to take a quarter of a pound of raw meat juice and thoroughly shred or mince it in a saucer, then cover with pure cold water, set aside for an hour in a cold larder, and finally strain through muslin; it may be sweetened when given alone.

As a golden rule, no other food than milk should be given till the age of seven months.

Strong barley water or *jelly* is made from pearl or Scotch barley, one ounce to a pint of water, boiled slowly till the quantity is reduced to three-fourths of a pint, then it is strained and set aside to cool. This food, being almost pure carbohydrate, requires cream and a little albumen.

In temporary gastric disturbance, with indigestion of fat and proteid, this barley jelly may be given, diluted and slightly sweetened, for a day or two.

Mutton broth and *vegetable soup*, carefully strained, are also valuable for tiding over temporary difficulties.

Mellin's food contains abundance of soluble carbohydrate, but insufficient nitrogenous matter, and practically not any hydrocarbon. Diluted with cow's milk, it is still wanting in fat, and contains too much sugar. But it is a valuable food, as it presents the carbohydrate in a soluble form, whereas the other foods are less soluble. Most of these foods are deficient in nitrogenous substance and fat, but in suitable proportions they may be employed with diluted milk.

Whey from cow's milk may be given, but some proteids and fats will still be necessary. The cream and whey may be mixed as in artificial human milk, but some white of egg should be substituted instead of the fresh cow's milk. Sometimes whey mixed with a few teaspoonfuls of boiled milk and a little cream, will be kept down when simply diluted cow's milk is not. I have also tried with success the raw yolk of an egg with whey; there is plenty of fat and nitrogen in this mixture. Barley water may be strengthened in fat by adding a little yolk of egg or cream. *Oatmeal water* is also of value; its chief constituent is carbohydrate. Two table-spoonfuls of oatmeal should be boiled in a quart of water for four hours, and even longer; then strained through muslin, and the liquor that filters through used. Peptonized milk and peptonized gruel are other resources when the food passes through the intestines undigested.

More will be said of these methods of feeding under the heading of athrepsia, diarrhœa, and other diseases. Beef-tea, mutton broth, mutton jelly, soups, calf's-foot broth, and other stimulants and foods are sometimes used in the bringing up of the hand-fed infant; but their mode of preparation and special uses will be more conveniently considered in other places.

Voltmer's artificial human milk* certainly deserves a trial; it has been in use for five years in Germany.

"*Strippings*" is another useful food when there is indigestion of proteids. "Strippings" is the name given to cow's milk drawn from the glands after the ordinary supply has been taken. It contains more cream, but less casein. Indigestion of fat or cream is of rare occurrence in infants. "Strippings" may, if necessary, be diluted with water, or whey, or lime water (if acid), or thin barley water.

* Agent, Hardman, Birmingham.

Food warmers and preservers are not to be recommended. The food should be made fresh each time, for in any food-warmer fermentation necessarily follows the preservation of the food. Water may easily be made hot in a few minutes with a spirit lamp or fire. Condensed milk and Mellin's food, with grape juice or orange juice in small quantities, separately from the other foods, are the best for *long journeys* or voyages in early infancy.

The *temperature* of the food should be about 95° F.

The *reaction* of all foods should be alkaline, or at least not acid. Cow's milk from London stalls is frequently acid; this is undesirable, and if such milk has to be used lime water should be employed just to neutralize the acidity of the milk. But except for this purpose, and when it is employed to remove the aperient tendency of asses' milk (which tendency may also sometimes be removed by boiling), lime water is not called for in the hand-feeding of children. Lime water as a preventive of solid coagulation does not appear to suit nearly so well as barley water or Mellin's food. I have frequently merely effected this substitution, and with great benefit to the child.

Constipation occurring in hand-fed children scarcely deserves the name of disease, but doubtless it points to a tendency thereto. It may be relieved, if not obstinate, by placing a pinch of phosphate of soda or carbonate of magnesia in the milk at two or three meals.

The ordinary *feeding bottle* carries with it one great disadvantage. It is almost impossible to keep the tube and other not easily accessible parts of the bottle clean. Consequently I never use the bottle with the tube. The old-fashioned slipper-shaped bottle is the best. It is true that the flow of milk from it is too easy. But this difficulty is easily overcome by tilting the bottle less or more according to the vigour of sucking.

tissues, it must be regarded as a valuable food. When the child is weaned, a custard pudding—one egg to half-pint of milk, and a little sugar—may be allowed every day. Milk, however, still forms the staple of the diet. About three or four parts of cow's milk to one of water is the usual proportion for seven months and ten months respectively.

At and after 12 months.—The cow's milk may be given pure about the age of one year. The bottle should be dispensed with, and a cup or feeder used instead. The food may now consist of proteids, fats, and carbohydrates derived from other sources than milk. Eggs may supply proteids and fats. If it seem necessary or advisable, there is no objection to a little mutton, and mutton fat even at 12 months, but generally actual meat or food should be postponed till 18 months. Red meat gravy with a little fat from the joint may be given. The meat should always be minced and the flesh pounded. Breast of chicken, mashed cauliflower, mashed mealy potato may all be employed. The great principle is to prescribe food which, when in the stomach and duodenum, shall present the largest possible surface to the action of the digestive juices. Bread and butter under the age of two years I regard as bad. If the bread be at all new, large lumps are formed, whose exterior alone comes into efficient contact with the digestive juices. The interior of these lumps undergoes fermentative processes with the development of irritant products which excite catarrh of the mucous membranes and cause other nervous disturbances. The bread should always be second, indeed I prefer third day's bread, and it should be crumbled into the plate before letting the child eat it. Kept bread becomes drier and less coherent, "crumbly," and therefore easily broken up into particles, whose collective area is very large and extensive, enabling the digestive juices to attack at once a large amount of material.

When the teeth are fully developed and fill the jaws, the

child should be taught how to masticate. The object of mastication is to "pulpify" the food, and thereby to present the largest possible surface to the action of the digestive fluids. Henceforth most articles of diet may be allowed. But beer, wine, spirits, cheese, pastry, and pork should be interdicted.

Foods.—1. Chiefly albuminous are meat, poultry, game, wild fowl, fish, milk, eggs, cheese, tripe, oysters.

2. Chiefly insoluble carbohydrates (starchy) are wheat, flour, bread, oatmeal, barley, rye, Indian corn, rice, buckwheat, beans, peas, lentils, chestnuts, potatoes, tapioca, macaroni, sago, arrowroot. Chiefly soluble carbohydrates (dextrin and sugary) are biscuits, carrots, parsnips, turnips, beetroot, figs, honey, bananas, apples, treacles, manna, grapes, beer, cocoa, chocolate, and melons and fruits generally.

Chiefly hydrocarbons (fats) are bacon fat, mutton and beef fat, butter, cream, and eels.

Many vegetables, such as those in list two, contain a percentage of vegetable albumen or legumin, including also green vegetables, cabbages, spinach, broccoli, sprouts, watercresses, radishes, and tomatoes.

All foods also contain much water and salts of potash, sodium, &c.

The following are some useful foods and stimulants which are freely prescribed in many diseases. I have only given those that are most serviceable, and that I have used most.

Bread jelly is made by soaking the crumb of seconds flour, third day's bread, in cold water for eight hours. The water is then all squeezed out to get rid of lactic acid and other products of fermentation. The pulp is next placed in fresh water and boiled gently for half an hour, so as to burst the cellulose capsules of the starch granules. The water is then strained off and the pulp squashed through a fine hair sieve into a mould, where as it cools it sets into a jelly.

Enough of this is mixed with warm water or milk to make food of a thin consistence. It may replace barley water.

Oatmeal or barley milk is made by boiling a teaspoonful of oatmeal or barley in four ounces of water for 15 minutes, and then adding an equal part of skimmed milk.

A good *veal, beef, and barley tea* may be made by stewing for six hours one pound each of fresh veal and fresh beef and two ounces of pearl barley, in three pints of water, it should be strained through a tammy, and be seasoned to taste; the resultant amounts to one pint.

Port wine jelly is made from half-a-pint of port wine, half-an-ounce of gum arabic and of isinglass, an ounce of sifted sugar, and a fragment of cinnamon. These should stand all night tightly covered up. Next day put the jar containing the ingredients into boiling water and simmer till all is dissolved, then strain and let it stand till cold. It may be cut into fragments for use.

Whey is easily made by adding three teaspoonfuls of wine of pepsin to a quart of warm fresh milk, and allowing the mixture to stand at a temperature of 98° F. for an hour. The curd is removed by straining through muslin.

White wine whey is made from half-a-pint of boiling milk and one glassful of sherry strained through a fine sieve and slightly sweetened with sifted sugar. It is a valuable food and stimulant in infants.

Brandy and egg is made by frothing three eggs, four ounces of cold spring water, two lumps of sugar, and stirring all together.

Mutton jelly is made by stewing six shanks of mutton in three pints of water, with half-a-pound of lean beef. The shanks should be soaked several hours in water, and scrubbed afterwards. The ingredients are simmered gently for five hours. Then the soup is strained, and the fat removed. A little pepper and salt to taste may be added. Portions may be warmed up as required.

To peptonize foods Benger's liquor pancreaticus is the preparation I am accustomed to employ. Half-a-pint of cow's milk, five ounces of boiling water, a teaspoonful of Benger, and ten grains of bicarbonate of soda are all mixed together in a covered vessel and placed near the fire under a tea "cosey." After the peptonization has continued for an hour the process is stopped by boiling the mixture for two minutes in a clean food pan. The food may be sweetened with sugar of milk for an infant. The same maker's pancreatic powder—or Fairchild's or Savory and Moore's pellets—may be used instead.

Pounded chicken and underdone pounded meat, mutton or beef, are frequently prescribed.

The following is an average *dietary for healthy children* above the age of two years :—

Breakfast at 8 a.m. Half-a-pint to a pint of milk, with two slices of bread and butter and a small cupful of well-boiled oatmeal.

Dinner at noon. Roast or boiled mutton, or roast beef, or roast chicken or turkey, three ounces; mashed potato, four ounces, with plenty of juicy gravy; a slice of dry bread, and three tablespoonfuls of custard or rice pudding or sago, with a little cream.

Tea at 4 p.m. Half-a-pint of milk, with two slices of bread and butter or rusk or dry toast.

Supper at 8 p.m. Half-a-pint of milk flavoured with a little chocolate, and some dry biscuit or milk toast.

As a rule nothing but water should be allowed as a drink between meals. Some children digest the principal meal better later in the day—say at two or even four p.m. The nurse should see that the food is eaten leisurely.

When children have reached the age of puberty they may take most foods allowed to adults, though it should not be thereby inferred that the usual methods of feeding in adults are all that can be desired.

The staples for breakfast at 8 a.m. should still be milk, oatmeal porridge, bread and good butter or Devonshire cream. A little white fish, or eggs, or bacon, especially fat bacon, may be allowed also. Fruit is also good, such as apples, oranges, grapes, peaches, plums, pears, strawberries. The staples for dinner at one or two o'clock should be clear soup, roast meat or game, with a little fat, dry bread and potatoes, with some other vegetable, such as cauliflower, parsnip, broccoli, spinach, stewed celery, peas, beans, cabbages, or tomatoes. A little light pudding of rice and milk, or sago, tapioca, or stewed fruit with cream may also be allowed.

For luncheon and supper cocoa and milk, with bread and butter, dry biscuit, rusk, or toast with butter or cream may be allowed.

None of the dishes should be of the *entrée* or *rechauffé* description. Fried foods, sauces, condiments, or high seasonings are not permissible. By "fancy diet" is understood that which the child may feel disposed to take. It is ordered with a view to promoting and pleasing the appetite, which, as we have seen, is a very important matter.

Meat, fish, flesh, or game may be allowed as albuminous bodies; bacon fat, or cream, or fresh butter as hydrocarbons, malted rusks, or biscuits, with a little sugar or compôt of fruit, as carbohydrates. In many cases where fancy diet is ordered sugars and starches must be allowed in but limited quantities.

CHAPTER III.

INDIGESTION—DYSPEPSIA—SIMPLE GASTRIC CATARRH.

THE *symptoms* of indigestion or dyspepsia, whether in infant or child, may be *one*, *few*, or *many*. Their nature is practically the same as in adults. Vomiting may mean nothing more than an overfull stomach in a healthy infant. In the new-born the stomach is almost cylindrical, without the curvatures, which are slowly acquired as months go by. The shape of the adult stomach, like that of the adult *caput cœcum coli*, is doubtless developed as the result of continued distension from feeding. In some small adult eaters the anatomical gastric outlines are but poorly marked. Like all reflex actions, emesis more readily occurs the younger the infant. As an incomplete rule, indigestion—gastric catarrh—is unattended with fever. It is, of course, frequent in fevers, but the degree of catarrh in these varies from slight to severe. Constipation, diarrhœa, or irregular action of the bowels may coexist with indigestion. Owing to the tendency of catarrh to spread, the younger the infant the more is the likelihood of diarrhœa complicating indigestion. Symptoms at a distance from the stomach—sympathetic or reflex disturbances—are common. The brain and cord may show disordered action by restlessness and crying in infants, and by moping, languor, and lassitude in older children. The symptoms may be due to actual pain or morbid sensation, or to deterioration of blood caused by interference with the chemico-physical processes of digestion. The urine may be loaded with pale or pink lithates, and uric acid crystals may be seen in the urine. Most likely the liver shares in the gastric derangement (see biliousness). The nervous phe-

nomena may include twitchings of face and limbs—clonic spasm—and carpopedal contractions—tonic spasm. Or there may be bilateral convulsions of mixed tonic and clonic spasm, with or without faintness or loss of consciousness. The younger the infant the more frequent are these symptoms.

In *neurotic* children the symptoms are often sudden, paroxysmal, and entirely out of proportion to the exciting cause. Vasomotor phenomena—pallor more than flushing—and cardiac irregularity, or intermittency, or syncope may also be observed. Peevish cry, hot skin, acid eructations and sour-smelling breath are frequent symptoms. Gastro-intestinal colic is indicated by violent paroxysmal screaming, white or livid face, hard, tense, and distended belly, cold feet and hands, and diarrhœa. The tip and sides of the tongue are often abnormally clean, and the fungiform papillæ enlarged. The dorsum of the tongue may be furred or clean, or show a "mapped" configuration. The "mapped" or "geographical" tongue is not characteristic of syphilis. The indigestion may be a thing of the moment, may last a week, or be prolonged for several weeks. If the last occurs in infants, athrepsia (q.v.) will be the result.

There may be *indigestion* of *proteids*, of *fats*, or of *starches*. Sometimes there is an individual peculiarity or idiosyncrasy, the infant or child being unable to digest milk of any kind, or only of one kind, and that may very rarely be the mother's milk. And yet the mother may be in perfect health, and obeying the laws of hygiene in every respect. The commonest form of indigestion in infants is indigestion of starchy matter—potatoes, the various infants' foods—the more so the less malted they are, tapioca, barley, sago, rice. The salivary glands are probably not fully developed till the mouth is full of teeth, but the pancreas most likely acquires digestive powers over starches long before this.

The best guides to digestibility of any articles is the watching of the baby's *growth in stature and weight*, and careful *macroscopical, chemical*, and *even microscopical examination* of the *stools*. Mere increase in weight may be due to increase of fatty subcutaneous tissue—as often as not a sign of faulty kinds of food. These fat flabby ones (polysarcia), are seen, after exclusive feeding on Ridge's, or Hard's, or Neave's food, which are also responsible for the opposite more distressing and but little less dangerous condition of emaciation—athrepsia. Fatness and flabbiness in an infant is often combined with rickety bones and with rickety mucous membranes, that take catarrh on the slightest chill or other cause—*e.g.*, atmospheric impurity.

There is often indigestion of *alkali albumen* or casein especially of cow's milk, which, in its hard, dense, cheesy lumps, does not present the largest amount of possible surface to the action of the gastric and other juices. This form of indigestion is frequently a temporary one, lasting a few days. Even with cow's milk it is best not to tax the powers of the digestive juices to the uttermost. The curd must be divided by mucilaginous fluids—gelatine, isinglass, mucilage of acacia, or, best of all, barley water (see p. 22).

Indigestion of fat is best discovered by an examination of the stools; the globules of oil may be seen in the midst of the other dejecta, and the microscope will detect them easily. Much fat has been experimentally found greatly to prolong gastric digestion, even without causing indigestion.

As in adults there may be indigestion of *liquids*, especially in children of the second dentition. A simple restriction in the amount of liquid drunk at meals, with the prohibition of play for half an hour before and an hour after meals, will effect a cure. A free drink may be allowed midway between meals, *i.e.*, about two hours after food.

Now, the real treatment of indigestion will consist in *removing its cause* in any given case.

The cause may lie with the *mother's milk, food utensils food, stomach,* or *nervous apparatus.*

The mother's milk may be spoilt by her ill health; by her eating or drinking unsuitable articles of consumption, such as rich foods, too much meat or sugars, fruits, and even fats with highly seasoned dishes; too much beer, or tea or coffee by indigestion and constipation; by fatigue from long walking or mental exercise; by nervous prostration from anger, fear or excitement of any kind, whether due to irritable temper or sufficient exciting cause. Any error of the above-mentioned order should be corrected if possible. If not, then the suffering infant must seek the breast of a healthy wet-nurse. But the breast should correspond as nearly as possible to the mother's breast, for the milk is richer in albumen and fat the longer the interval after parturition. This percentage of proteids and fats may not be digestible by the particular infant. A very frequent cause of indigestion in infants especially when cutting teeth, rickety or otherwise delicate is the state of the *food utensils.* Everything used about the nursery must be not only clean but aseptic.

Next, the quality of the *food* may be unsuitable, either because the glands and other actions necessary for its digestion are not developed, or if developed, too feeble; further, the article itself may be altogether indigestible by the particular organism that has ingested it. Tea, coffee, cheese, pastry beer, wine, spirits, celery, sauces, and condiments, of all kinds excepting salt, but including mustard and pepper, should not be allowed; much drink at meals, much sweets, jam, fruit much starch, potatoes, rice, barley, tapioca, sago; much pudding of any kind—are all to be prohibited for children They cause indigestion either by giving the gastric and pancreatic juice too much to do, by diluting the gastric juice too largely, or by preventing its proper secretion, and possibly also by mechanically interfering with the movements of the sto

mach, and indirectly by impeding the action of the heart and circulation. Of course abnormal food is a cause, above all others, of indigestion. Too large a quantity is a cause usually of but fugacious indigestion. Nature is generally equal to this task in infants; vomiting and increased peristalsis may set matters right unless the child be rickety or strumous, when one such indiscretion may entail a gastric and enteric catarrh. The food must not be taken ravenously. A ravenous method of eating signifies a diseased condition of the gastric nervous system, and causes further disease by the indigestion that results from overloading. Food entering the stomach too quickly probably acts as a shock would do, arrests proper secretion of juice, and may cause paralysis of movement of the stomach—then mucus is poured out instead of juice, and fermentations occur. Lumps of food, swallowed without sufficient comminution—either in the plate or other utensil, or in older children from insufficient mastication—cause indigestion by not presenting the largest possible surface to the action of the juices, and thus allowing lumps to remain long undigested, and to become acid from fermentation.

Irregularity in the intervals between meals causes indigestion, because Nature, especially in the weakly ones, acts more or less after *habit*. If we surprise the stomach either by taking it unawares with food or by depriving it longer than usual, the nervous mechanism may be thrown out of gear, and the customary muscular and glandular actions may not occur, or occur imperfectly.

The *stomach* itself may cause indigestion by its functions being disturbed through the agency of the nervous system. This may happen from sudden expenditure of nerve force, as from temper, fright, anger, or other emotions. Brain disease may disturb any of the functions of digestion. But the cause of all causes in infancy and childhood is catarrh of the gastric mucous membrane, induced doubtless largely by

unsuitable alimentation, as described in the last paragraph, but also produced especially in the debilitated, the rickety, or the strumous by catching cold. The commencement of the first and second periods of dentition are also cold-catching epochs. Gastric catarrh is as common as intestinal catarrh, and as catarrh of the respiratory passages. In infants this is especially true, and in them also the whole hypoblastic structures may be involved in universal catarrh.

Again, the lesson of protecting the surface of the chest, belly, thighs and legs is to be inculcated. If these extensive areas be protected from chilling by closely-fitting woollen garments the danger of even rickety infants taking cold will be reduced to a minimum.

The extent of surface often freely exposed during the summer and autumn—when sudden changes of temperature and humidity of atmosphere are most prone to occur—is often very great. Think of the relatively large number of square inches in the surface of the buttocks, belly, thighs, and legs, that go uncovered in summer, remember the great elasticity of the skin, the contractile and expansile power of its vascular supply, and the necessity for protection of this heat-radiating surface will perhaps appear greater.

Sometimes with and sometimes without gastric catarrh the *musculature* of the stomach is disordered; it may not churn the contents sufficiently to bring the juice into intimate contact with all parts and prevent undue cohesion; or the pylorus may open too rapidly and food be ejected into the duodenum before its time.

The functions of the stomach depend for their healthy existence not only on local hygiene, as above indicated, but on the maintenance of the health of every other organ of the body, and therefore of the collective health. The infant that does not move its limbs, that does not cry, and struggle, and resist in the exercise of playing, loses general tone, and in

this loss the stomach also shares. "Wheel within wheel" is the unconscious motto of the various processes that go on in the organism. A daily evacuation of the bowels promotes digestion, not only by removing all effete and excrementitious matter—thereby preventing deterioration of blood (stercoræmia), with its consequences on the various organs at large, but the evacuation is accompanied by muscular movements, the effects of which on the portal and hepatic circulation cannot be otherwise than beneficial. Sedentary habits in older children may be equally a cause of indigestion as of constipation.

Every contraction of the trunk and limb muscles forces lymph and blood onwards towards the heart and improves portal and hepatic circulation. The greater the rate of flow of blood into the right auricle from the inferior vena cava, the better will be the flow from the hepatic veins—largely as the result of an aspirating influence exerted by the caval on the hepatic blood. Again, the deep inspirations of exercise increase the flow of venous blood towards the heart by a similar kind of aspirating influence. The "wheel within wheel" principle is yet again illustrated by the improved action of the heart, liver, and intestines that results from exercise not carried to the fatigue point; and this improvement must react advantageously on the health of the central and peripheral nervous system by which every organ is kept in harmonious and accordant action.

Bad habits are easily formed in infants, doubtless owing to the greater relative facility of nerve discharge and less resistance to spread of nerve currents. The habit of chronic vomiting may be contracted. There may be but little catarrh of stomach associated with it. It may, like the habit of chronic diarrhœa, with which it may be associated, lead to athrepsia. The dietetic and hygienic treatment is of the first importance. Nervine sedatives help to break the bad habit.

Alkalies and aromatics are special gastric sedatives. Belladonna, Dover's powder, and bromides may be prescribed with them as more direct depressants of nervous irritability.

Like other catarrhs, that of the stomach is prone to *recur*, partly because the causes remain, and partly from the establishment of a habit of catarrh. The causes are mostly of a preventible kind, and the habit of recurrence must be combated by tonic measures such as are recommended to remove the habit of tonsillitis and of nasal catarrh. It must not be forgotten that gastric indigestion may result from an *inherent* or *congenital inadequacy* of the gastric functions as well as from an acquired insufficiency—the result of disease or removable causes. The stomach may be inadequate, as the liver may be too small. Mostly, there is a reserve of power in each organ; but there may be no reserve in one or many organs, as Murchison argued for the liver.

Special treatment.—The first thing to do locally for the stomach in any case of indigestion is to empty it. In infants this will hardly be necessary, for vomiting will probably have occurred. The best emetics are sulphate of copper gr. $\frac{1}{2}$ every ten minutes, or wine of ipecac. ʒi. every ten minutes—till emesis occurs, or zinc sulphate gr. x., repeated if necessary. Unfortunately, the catarrh may be increased by irritant emetics; and, if possible, vomiting should be excited by fingering the fauces and epiglottis. The emetic turns out all irritant matter, including much glairy mucus, which may be bile-stained or greenish. To prevent the child's clothes from becoming soiled by vomit, a towel may be placed under the chin and over the chest and belly. When soiled it must be removed, and replaced by a very dry and clean one. The *bowels* should be cleared with a small dose, ʒss. to ʒi., of castor oil, or 5 to 10 grains of rhubarb and soda, or half-a-dram of compound liquorice powder. These

expulsives, having cleared the way, often allay all irritation, so that vomiting and diarrhœa cease at once.

Now, there should be no hurry in further treating the case. The grand principle is to secure rest for the stomach and body, and not to excite fresh catarrh by fresh irritation. If there be a continuance of nausea or retching, teaspoonful doses of iced water or cold filtered water may be tried, and a small mustard (4in. by 4in.) plaster, to act as a counter-irritant to the centre for vomiting as well as to the stomach, laid about the epigastrium for ten minutes. The *feeding* should be done very cautiously, and all the directions given in this chapter be strictly kept. The cold water may be followed by small doses, given frequently, of thin barley water, mutton broth, beaf tea, veal, or chicken tea, or Mellin's food dissolved, one dram to the ounce but first cooled, in hot water. Milk, freely diluted with barley water, or "strippings" and water, equal parts, may be next tried, and thus gradually should the ordinary diet be resumed. Special care must be had not to overload the stomach with any kind of food. Bread and butter goes into lumps, and should be prohibited. Third day's breadcrumbs is best, but not too much of this. Before meat and vegetables are resumed—supposing the child to be over two years of age—the yolk of an egg, lightly boiled, and a little white fish—soles or whiting without the skins—may be given. The object should be never to give more than the minimum quantity of food that can be digested. This saves the energy both of digestive organs and of the body at large. If the child be *rickety* or *scrofulous*, treatment must be directed as for those diatheses.

As soon as vomiting has abated alkalies may be given with bismuth, and, if necessary, opium. The *alkali* is given chiefly to neutralize the excessive acidity associated with excessive secretion and fermentation of mucus. Also,

they and *bismuth* calm the irritability, and promote the disappearance of the congestion and catarrh. *Opiates* are given when restlessness and vomiting prove obstinate, but they should not be given unless necessary.

℞ Bismuth Trisnit., gr. v.
Sodæ Bicarb., gr. v.
Mucilag. Trag., ♏xv.
Aq. Chlorof., ʒii. t.d.s.

The ordinary prescription that I use is the Mist. Gent. Alk., or the Mist. Rhei et Sodæ should there be a deficiency of bile in the stools. The gentian and the peppermint in these are carminative and antifermentative. Tincture of nux vomica, ♏iii., may be prescribed as a tonic and antifermentative after the acuteness of the gastric attack has subsided. A drop of liquor strichniæ may be given instead. The prescriptions are suitable for a child two years old.

℞ Sodæ or Potass. Bicarb., gr. vi.
Tinct. Nucis Vom., ♏iii.
Inf. Gent. Co. ad., ʒii. t.d.s.

℞ Pulv. Rhei. Opt., gr. iii.
Pulv. Sodæ Bicarb., gr. vi.
Tinct. Zingib., ♏v.
Aq. Menth. Pip., ʒii. t.d.s.

For the *chronic indigestion* of children not apparently strumous, but only debilitated, the use of emetics is not required, unless the attack should be an acute one, occurring in the course of the chronic complaint. The most important indications are those mentioned in this chapter in regard to dietary, protection from cold, and the taking of exercise. Chronic vomiting is best stayed by Fowler's solution in drop doses immediately after meals. Drop doses of ipecacuanha wine or nux vomica, or fractional doses of calomel, are also highly commended. The prescriptions just given are also

suitable as medicines. The bowels must be kept regular by simple means, including massage of the colon. Tonics of iron should be prescribed if there be anæmia; fluid extract of cinchona if not. The best form of iron is two grains of the ammoniocitrate, with five drops of rectified spirit, and two drams of distilled water for a child two years old.*

When indigestion in infants is revealed by agonizing pain, screaming, from flatulence and colic, *carminatives*, that stimulate the nerves and glands of digestion, as well as render the sensory or afferent nerves less sensitive, are of great value. Chloroform or caraway, or dill, or aniseed water, may be given with an alkali, which also acts by (1) increasing gastric secretion; (2) calming the nerves; (3) and as a preventive of the casein clotting too quickly. This is good treatment. But I object to the administration of alkalies to a healthy stomach. Severe colic may lead to collapse in feeble infants. This is combated by ten drops of brandy, or ether, or sal volatile, and by warm baths with mustard, also by wrapping the limbs, as well as the trunk, in cotton wadding. The child must be kept warm. The feet and hands are apt to get cold. They must be rubbed with the dry hand or stimulating liniment, packed in cotton wool, or placed in warm bran bags. Hot bottles may be used near the extremities.

Simple Constipation.—By simple constipation I mean a confined condition of the bowels with its attendant evils which cannot be set down to any cause detectible by physical examination.

The proximate causes are doubtless deficient secretion and defective peristalsis. But these derangements may be caused in a thousand ways.

Diet.—All that has been written in the article on indigestion has a direct bearing on the subject of constipation. The food may be unsuitable. It may be too bland, and leave no

* This is Vinum Ferri.

residue sufficient to stimulate the peristaltic action ; or it may be too irritating, and set up gastro-intestinal and hepatic disorders, and thus remove or pervert a condition or conditions necessary to the perfect performance of the peristaltic action and secretions.

It should be remembered that constipation at the outset may be a symptom of derangement of some organ or function, but afterwards may become a further cause of constipation. Constipation begets constipation—an illustration of the vicious circle influence. Atony of the muscular coats of the large bowel, with consequent distension and tympanites, may be an important factor. It may be the result of prolonged constipation and the frequent use of large enemas. Dr Gee has written of idiopathic dilatation of the colon. I have seen one case at least in which death finally resulted at the age of ten months, apparently from this cause alone. The whole difficulty dated from birth; the final symptoms were those of intestinal obstruction. At the necropsy nothing was to be found but the enormous distension of the large bowel. Constipation is easily set up in children because of the great length, with twisting and turning, of the sigmoid flexure portion of the bowel.

Most often the diet requires alteration. Just as indigestion may be of certain kinds of food, so constipation may be caused by members of all classes of foods. Eggs, milk, too much starch and sugar (rice, sago, tapioca, potatoes, jams, &c.), are sometimes causes. When the food is too bland and too digestible, leaving insufficient residue, fresh vegetables, such as cabbage, turnip, or cauliflower, oatmeal well boiled and softened for breakfast, apple sauce or baked apple, figs and prunes, and compot of fruit—for children a few years of age—will give the necessary relief. Doubtless the glucose some of these articles contain contributes to their laxative effect; and perhaps they have other properties, such as

freshness, which also constitute part of their useful action. Coffee and tea may in older children cause constipation. Malted rusks or biscuits sometimes do good when the constipation results from imperfect digestion of starch. Whole meal bread may be prescribed, and its beneficial influence is partly attributable to mechanical action.

Constipation may be traced to insufficient drinking. I have cured several cases in growing girls by prescribing the imbibition of a quart of water in the day.

Many cases in infancy under two years simply require attention to the diet. They may be eating too much starch in the form of bread, or the various infants' foods. Sometimes the mother's milk is constipating to the child. Well-boiled oatmeal for the mother's breakfast may correct this. For the hand-fed infant a half teaspoonful of manna may be dissolved in the food; it contains a kind of sugar, mannite, on which its relaxing action depends. A teaspoonful of Mellin's food, also from its glucose, may answer as well. Five or ten grains of phosphate of soda dissolved in the milk, three times a day, acts as a gentle laxative. Oatmeal water may remove constipation. The meal is boiled for four hours, then strained through muslin. The liquor may be given to the child alone, or with its milk. A small dose of codliver oil or salad oil sometimes effects the purpose. In such cases the mother's milk or the artificial food is deficient in fatty matter. The mother should be told to drink a cup of rich "strippings" or milk half an hour before nursing the baby, or a little cream may be added to the infant's food.

Simple constipation is very frequent in otherwise healthy infants and children. It may depend largely and primarily on deficient activity or inadequacy of the liver and pancreas.

Doubtless the regulation of the regimen and exercise with proper clothing will do much to render such inadequacy as little detrimental as possible. In older children, and mostly girls, the

abdominal muscles are not used, and the portal circulation is sluggish as the result of want of exercise. This would still further increase hepatic and pancreatic insufficiency.

A cold douche every morning (see Catarrh) may effect a change for the better, not only by improving circulation and general tone, but also by acting as a direct stimulant to the muscular and nervous apparatus of the bowel.

When constantly recurring catarrh of the bowels is the cause of constipation, the flannel or woollen binder to the belly is of the greatest practical importance.

Euonymin, as a direct hepatic stimulant, may be given in grain doses twice or thrice a day, and is frequently serviceable in children over 5 years of age.

Prolapse of the bowel may complicate constipation; the bowel prolapsing after every action, whether induced by purgatives or enema. *Ulceration* of the sigmoid flexure and rectum may result from fæcal irritation. The occurrence of prolapse in children old enough to remember is a further cause of constipation, for they will not empty the bowel owing to the pain given them by the prolapse. Again, *screaming* will keep down the prolapse, and so render the submucous tissue more lax, and increase the liability to descent of the bowel. *Fissures* or *sores* about the anus may also be efficient causes of constipation.

When simple hygiene and prophylaxis fail, it is well to begin with a calomel and scammony or jalap purge; 2 grains of the former and 8 of the compound powder of the latter may be given to a child five years old.

Sometimes the rectum has to be emptied by enemata. A piece of soap or a pencil of paper passed just within the anus will often suffice in little infants. Good enemata are warm sweet oil, one to four drams, retained a few hours if possible; then olive oil, soap and water, about four ounces. A dram of salt to four ounces of water is also effective. If

these do not operate, a dram of turpentine or castor oil may be added. The enema must be injected gradually and gently with an elastic bag. The Eguisier may be employed. The *repeated* use of large *enemata* is bad, as it leads to dilatation and atony of the descending colon, which is then not called upon to exercise its normal contractile functions. And large, hard, cindery masses may rarely have to be broken down by irrigation and the fingers, the child being under the influence of chloroform. Once the way is clear, the sigmoid flexure and rectum *must* be evacuated *daily*. The importance of establishing the habit of a daily evacuation cannot be overrated. Never let more than two days go by. Then, if the child does not scream, the enema may be used. But the bowels must be kept acting at all costs, and without the *frequent* use of injections. The best enemata are simple soap and water, with or without a tablespoonful of sweet oil or a teaspoonful of castor oil. The quantity may vary from one to ten ounces—the less to effect the purpose the better. The temperature should usually be warm. Sometimes a cold irrigation is better, and causes more action of the muscular coats. Salad oil, one or two teaspoonfuls, in the morning with the breakfast, or a fair amount of bacon fat, with Decoc. Aloes Co., a tablespoonful or two at night time, has cured a large percentage of cases. But the mixture of rhubarb and soda, three times a day, is a decided advantage in many cases, if there be flatulence, acidity, and pale clayey stools. Infriction of oil or dry rubbing of the abdomen—massage or kneading along the course of the colon—especially with some liniment of soap or camphor, ten ounces, to which an ounce of tincture of aloes has been added, are valuable accessory measures.

If the regulations as to *diet, clothing, and exercise*, with the above instructions, be not sufficient to effect a cure, the next

best method of treatment is by *saline purgatives*. The great point, as has been said, is to keep the bowels acting, and this should be done with the least possible use of drugs. Fluid magnesia, Hunyadi Janos water, Eno's fruit salts, or doses of sulphate of magnesia and sulphate of soda, may be given in such quantities as may be necessary to effect at least a daily liquid evacuation. Care should be taken, when such obstinate cases have to be dealt with, that the ingesta are not such as leave much residue, and too much food should not be allowed. Much vegetables, such as greens, peas, &c., are prohibited, because of their large residue. The theory is this: the constipation is ascribed solely to paralysis or atony of muscle, and a liquid evacuation daily prevents any distension or further atrophy. The plans of treatment must be regulated so as not to stimulate a paralyzed muscle. Large distending enemata are not therefore to be used.

When the bowels have been freely relaxed for a few days tonics that act on the muscular fibre are to be prescribed. It is supposed that the keeping the bowels empty will lead to the recovery of power in the intestinal musculature. Nux vomica, ♏vi., liquor strychniæ (♏iii.), aloes (aloine, gr. $\frac{1}{4}$-$\frac{1}{2}$) and astringent preparations of iron, are the best tonics. The doses mentioned above are for a child 10 years old. The aloes might be given as the Decoc. Aloes Co. in tablespoonful doses, or as aloine in half to three-quarter grain doses at night time. And a teaspoonful of salad oil may be given in the morning. The other medicines are given three times a day. The best preparation of iron is the perchloride tincture, in ♏v. doses, or the exsiccated sulphate in 5 gr. doses. The bowels must be kept acting whilst these are prescribed. Systematic exercise, gymnastics, and galvanism are very valuable aids to the treatment.

Galvanism is administered once or twice a day for ten minutes, preferably at the customary hour of evacuation.

The positive pole is fixed over the sacrum and negative moved over the sigmoid flexure.

Tincture of nux vomica, ♏½ for each year of age, in the Mist. Gent. Alk. has proved of service, and tincture of belladonna, ♏v. for a child two years old, sometimes aids this. Infusion or syrup of senna, ʒi. and upwards, will be the best for some children. All these remedies may have to be continued for some time. I can speak strongly of the value of liquid extract of Cascara Sagrada in doses of 15 to 20 minims, or Martindale's pastiles of the same, and I have set bowels right by its means that resisted aloes, nux vomica, senna, euonymin, and rhubarb. Sometimes a pill of aloine and calomel, each in half-grain doses, for a child of five, has succeeded best. I have known a sixth of a grain of podophyllin, three times a day, to succeed when aloes, rhubarb, and senna have failed. The tincture of podophyllin may be given in doses of a few drops. White wheaten gluten suppositories (half-size for children) inserted every evening, or morning and evening, are recommended.

Pepsin in five or six grain doses with the meals, three times a day, certainly relieves some cases of constipation, probably by improving digestion and righting the intestinal contents.

Spurious diarrhœa, consisting in the passage of blood and slime, often discoloured by fæces, may be due to the presence of impacted matter in the sigmoid flexure.

Prescription for an infant of six months :—

℞ Magnesiæ Carbonat. } a. a. ʒii.
Mannæ Opt. }
Syrupi Sennæ, ʒii.
Aq. Menth. Pip., ad. ʒiii. ʒi. two or three times a day, as may be necessary.

With clayey, hard stools, sallow skin, and loaded tongue, for an infant of one year :—

℞ Resinæ podophylli, gr. ¼.
Spirit. Vini Rect., ♏xx.
Aq. Menth. Pip. ℥iss. ʒi. twice or thrice a day.

The treatment of simple diarrhœa.—Whether there is diarrhœa or constipation must be looked upon as a matter of accident. Perhaps it depends on the state of the muscular coat of the large bowel. If this is in an atonic state constipation results. The *causes* of both symptoms and of indigestion are not very different. Bad feeding and catching cold may cause one or the other. To avoid these causes consult the chapter on indigestion. *Rickety* diarrhœa is a simple diarrhœa caused by bad feeding and chills. A pair of flannel drawers or a combination garment protects the surface of the abdomen from chill. In simple diarrhœa of chronic kind, a waistcoat of flannel tightly applied to the abdomen, or the familiar flannel binder with fastenings behind, reaching well up the ribs and down to the hips, is very serviceable. Dentition diarrhœa is well treated by the same means. Defects in the mother's milk—*e.g.*, when it contains colostrum after the first week—may be a cause. The reaction of the alimentary tract should be everywhere alkaline except in the stomach. Acidity in the mouth and fauces leads to the development of thrush, and acidity promotes unhealthy states of the mucous membrane of the intestines. Hence the great value of alkaline remedies in childhood. But most cases of simple diarrhœa, whether the motions be watery or slimy, or bloody, with fragments like "meat washings," are best treated medicinally with the Mist. Olei Ricini.* But attention to the *diet* is absolutely necessary. It should not contain pure cow's milk, nor much starch, or fruit, or sweets, for these articles cause acidity of the intestinal contents, doubtless because they undergo fermentations. If the diarrhœa be known to be caused by the ingestion of some obvious irritant, any

* For formula, see treatment of Rickets.

purgative that quickly acts will relieve the patient at but the slight cost of a little strength, A teaspoonful of castor oil is the most useful for this purpose, but sometimes the rhubarb with soda is preferred—of each four or five grains made into a paste with glycerine, or given in pilules or capsules—and this is best when the stools have but little colour. Fluid magnesia is easily taken. Actual *astringents* and *paralyzers* of the muscular coat, I am not in favour of using as a rule, but *carminatives*, which may be described as very mild stimulants, appear to me to be better. However, I will not say that astringents and opium shall not be used in the simple form of diarrhœa, because in certain cases they may be necessary, but not often, as I think.

In the first few months of infancy the simple form of diarrhœa is very commonly due to sourness of the food or to the presence of large curds in the intestines. Barley water tends to prevent the formation of these lumps, and because of its gelatinous nature, for isinglass will answer the same purpose. Infants at the breast should not be fed so frequently nor so largely. The duration of each meal should be shortened. Attention should be given to the cleanliness of food and food utensils, as advised in the general chapter on feeding. Authors advise that dentition and other simple diarrhœas be not checked too rapidly, lest cerebral symptoms ensue. I cannot corroborate this conclusion. General hygiene, including fresh air, bathing and clothing, is very necessary. The gums may be examined, but rarely require lancing. Rubbing them with paregoric and water ♏x. to ʒi. is recommended, or a solution of zinc chloride gr. i. to ℥i. Take care not to let these be swallowed. A mixture containing three grains of bismuth trisnitrate, and three also of bicarbonate of soda, with five drops of chloric ether or sal volatile or spt. chloroform, may be administered in two teaspoonfuls of chloroform or peppermint water three

times a day. And this I use when the Mist. Ol. Ric. has not done much good, or sometimes, if the stools be not offensive and only watery, I employ it first, for I have found that it more frequently succeeds under these circumstances than the other mixture of my choice. Of *chalk and catechu* for this diarrhœa I know nothing, but others recommend it. Tincture of *opium* I use in half-drop or drop doses if the number of stools be very great and the quantity passed not much, or if there be any of that explosive action which sometimes constitutes a feature of infantile diarrhœa. A tonic of steel wine or cinchona may round off the treatment.

Lienteric diarrhœa, in which the food is ejected undigested, and where every act of ingestion causes rapid peristaltic action, is best treated with bromide of potassium in two grain doses every hour twelve times a day. This may not succeed, then we may employ the liquor arsenicalis ♏ii. and vinum ferri ʒii. three times a day, for a boy of six years, which is the commonest age for this diarrhœa. Liquor strychniæ ♏ii., or the tincture of nux vomica in the Mist. Gent. Alk., is sometimes more useful. And some advise the arsenic and strychnia to be given together, one drop of Fowler's solution and two drops of the tincture of nux vomica, three times a day.

Athrepsia—Food Atrophy—Marasmus.—This wasting of body without tuberculosis is the result of chronic inflammatory disease of the stomach and intestines, due to the constant ingestion of indigestible food. The vitality, or want of it, is an element in the production of the atrophy; but even the strongest infant, endowed with high vitality, would probably be unable to prevent itself from becoming marasmic if sufficient improper food were supplied. As the name food atrophy implies, the chief cause of the disease is bad feeding. But, besides this dominant cause, bad hygiene of any sort, by lowering

vitality and the powers of digestion, acts as a more or less direct promoter of the atrophy. Amongst hygienic defects none ranks higher in the possession of baneful influence than a cold, damp, and impure atmosphere, with sudden variations of temperature. This induces frequent catarrhs of stomach, intestines, and respiratory passages.

The *causes* of athrepsia are the same as those of indigestion, constipation, and diarrhœa already considered, so that it is needless to repeat them. Marasmus is the outcome of their persistence. Athrepsia is easy of recognition. The wasting soon becomes evident when indigestion has lasted but a few days, and this, no matter whether the infant be at the breast or hand-fed. In older children, who may also suffer from food atrophy, the wasting, though less rapid, is soon noticeable. Screaming and crying are most striking symptoms. I believe that children suffering from tubercular atrophy never scream and cry with the violence of simple marasmic ones. The screaming may be discovered easily to be due to violent griping from excessive peristaltic action. Doubtless the exhaustion and wasting are promoted by this screaming, which prevents sleep at night. There is not only loss of all fat and wasting of muscle and liver, &c., but the blood grows thinner and paler, the number of red disks and percentage of hæmoglobin becomes greatly reduced. The appetite and bowels may be as variable as in indigestion. Rashes of red gum about the buttocks and other parts, erythemata and urticaria may be seen, and the mouth may be inflamed with simple stomatitis, or aphthæ and thrush may supervene. There is no fever, but the temperature tends to fall, and especially in cases that are about to prove fatal. Catarrhal pneumonia supervening on collapse of lung may raise the temperature. In the final stage of emaciation the skin becomes closely fitting to the bones everywhere, this gives a ghastly aspect to the face, especially when the

facial muscles act and draw the furrows that mark the nasolabial folds. In this condition œdema of the feet is not uncommon, and purpura may be seen.

The *diagnosis* is as a rule easy. Syphilis and tubercle may cause atrophy, and may be associated with the food atrophy; indeed, often are in out-patient practice. But there will always be signs of congenital syphilis. And with tubercle the lungs are not likely to escape, the cry is feebler, the temperature usually elevated. In children about two years of age doubt may exist for a time, especially when, though good feeding and hygiene improves the patient for a time, relapses occur. I have seen many cases, and made necropsies of not a few children of this age, in which it was impossible to be sure during life whether tubercle was present or not. There may be bronchitis in simple marasmus. A case of wasting and indigestion that goes on for many months is much more likely to be simple rather than tubercular marasmus. On the other hand, there can be no sort of doubt that tubercles do become obsolete in children as in adults.

For the *treatment of athrepsia* the reader should consult the sections on the principles and practice of feeding infants and children, and the articles on indigestion, constipation, and the various forms of diarrhœa. Taken in time, treatment is most hopeful. Simple and pure hygienic measures are alone necessary. There is great necessity for graduation in the administration of diet, especially when the atrophy is partly dependent on actual starvation. The thirst, vomiting, diarrhœa, constipation, screaming, will disappear like magic when the bowels and the stomach are emptied of their irritants and a proper diet is substituted. But little hope can be entertained of cases in which the emaciation has gone on to the development of a condition of "spurious hydrocephalus," with coma and convulsions, thrush in the mouth,

and a raw bottom. But even these may be rallied at least for a time by the administration of stimulants. Short of this final stage no case is to be regarded as hopeless.

Food atrophy may affect infants at the breast, but the directions given with regard to the mother as a nurse, and those for the getting of a wet-nurse, &c., will suffice to stay the wasting.

CHAPTER IV.

SECTION OF GENERAL DIATHETIC DISEASES.

Lymphatic tissues in childhood.—Great *activity* and rapid *spread* are central thoughts or physiological canons of infantile lymphatic tissues. Spread is most rapid along tissues of similar embryological evolution: mucous membranes, nerves and skin, lymphatics and vessels being fair respective representatives of hypoderm, epiderm, and mesoderm. Peripheral mucous, or cutaneous irritation, causes greater glandular enlargement the younger or the more "scrofulous," the child. Abscesses are more easily excited in infants than adults. Adolescence is attended with a striking subsidence of lymphatic hyperplasia. This often proves of therapeutic interest. The rise and progress of disease dependent on lymphatic activity forms a frequent and interesting study in children. Thus: catarrh of mucous membrane, corresponding glandular enlargement, possible subsidence of catarrh, continuance of glandular hypertrophy, caseation of same, wedging of same in lung tissue, suppuration and ulceration into bronchus resulting in *Bronchial phthisis*, whose future course may be variable and fully as eventful as its etiology. The story is somewhat similar in the mesentery and elsewhere. Striking also is the sympathy or contagium vivum, or whatever it is that causes other adenoid structures to overgrow and caseate when one has done so. Spread of morbid and healthy action is not only easier, but more marked in infants and children than in adults.

SCROFULOSIS—LOCAL (? TUBERCULOSIS).

The well-known characters of scrofulous lesions of the skin, mucous membranes, lymphatics, and bones, together with their wide prevalence, render it unnecessary that in a work on applied therapeutics addressed to the practitioner the author should be at the pains of describing such common lesions. He will, therefore, neither meddle with their causes, symptoms, or diagnosis, more than is necessary for the purpose he has in view, which is simply to indicate the lines of treatment he has found most useful, and to give, he hopes, a satisfactory sketch of other treatment in vogue.

Treatment—Hygienic and Prophylactic.—The aim of treatment is to "alter the constitution," or to restore the working protoplasm to normal modes of action. In what chemical or physical way scrofulous molecules of protoplasm differ from normal ones we do not know. The scrofulous protoplasm is prone to develop chronic lesions from the slightest cause. Permission cannot be given such organisms to deviate from a life of routine where the pleasures and pains should be confined within the narrow limits of their powers. Early to bed but late to rise, implying long sleep, is beneficial, with this provision, that the air consumed in the clinical chamber be fresh and pure.

The influence of *dampness*, *coldness*, and *impurity* of *atmosphere* is greatest in scrofulous organisms. A well-drained house, and dry, porous soil are absolutely necessary. Cold and dry is not so injurious, and may be made beneficial, but cold and wet is a sure depressor of vitality.

Strict attention is to be given to *habits* of life. A few hours of work in a light and airy room, and perhaps not more than an hour at a time, with out-of-door life as much as possible in fine bright weather are of great importance. The foot covering must be sufficient to keep out the cold and wet; but a wet play-ground or soil should be avoided. Goloshes or

rubber boots are useful to prevent the foot getting damp and cold.

Climatology.—A *sea voyage* is very valuable provided the weather be fair and the whole day spent on deck. Attention to the ventilation of saloon and berth is most necessary. Direct observations have shown to what an alarming extent the living-rooms may be contaminated by organic emanations, including bacteria. High barometric pressure appears to have but little influence as a therapeutic agent for scrofula. Or rather we know but little about it. Some children seem miserable at the sea level, and happier when at a higher elevation. *Mountain air*, with its bright, germless atmosphere is undoubtedly valuable; but resorts where over-crowding and ill-ventilation obtain should not be chosen. The *sea coast*, with dry air, at a high elevation and well-drained, is very good, with similar precautions about the impure air indoors. Dry inland air and farm-life suit some cases better.

A *bracing* sea air may be had along the east coast—Cromer, Southend, Folkestone, Broadstairs, Margate; a *relaxing* and warm climate at Penzance, Torquay, Bournemouth, Hastings, and Brighton in summer; a *medium* climate is met with at the above in winter time. The hill outside old Hastings is bracing even in summer. Ventnor, Undercliff, and the Riviera are also valuable resorts. In the selection of a suitable climate several factors have to be taken into account. A feeble circulation precludes the recommendation of very cold climates. But cold mountain air may greatly improve the circulation, possibly on account of the lowered atmospheric pressure. Nervousness or neurotic temperaments are sometimes worse, sometimes better at a great elevation. The assumed advantages of climate are: the avoidance of sudden variations in temperature, and therefore lessened demand on the vitality; the obtaining of fresh air,

free from septic and other germs, of sunshine that promotes nutrition, of protection from depressing cold east winds and continued unfavourable weather, of pleasant surroundings that also promote mental health and bodily nutrition.

Clothing should be adopted as recommended at page 7; this includes high-necked dresses, sleeves and drawers, &c.

Exercise is very valuable, but must not be carried to the fatigue point, or to the induction of palpitation. *Massage* may be useful when exercise is not possible. *Inunctions* may be combined with massage. Neat's-foot oil or olive oil are more cleanly and less disagreeable than cod-liver oil. They are partly absorbed by the lymphatics, and act as food. *Friction* increases lymphatic circulation. The massage removes waste products from muscles, aids circulation, and increases the action of the skin, as indicated by the hyperæmia. I do not think inunction of much value, and the fat tends to block the sweat glands unless careful washing and cleaning be practised.

Gymnastics are very beneficial. For the mode of action of these agencies the reader may consult special chapters. The doctor has to pay attention to every system of the body. The health of the *lungs* is promoted by avoidance of chemical and mechanical impurities of air. Large cities and towns are therefore injurious. Stagnant and damp air favours decomposition and sepsis, with the formation of foul organic acids and development of bacteria. Therefore valleys and low-lying stations are to be avoided. Sunlight, by its action through the retina, stimulates nutrition, as has been physiologically proved in animals. Places with short daily duration of sunlight are not, therefore, suitable for the scrofulous. Gymnastics expand the chest, and the lungs act more efficiently as depurators of blood. That tendency to apical condensation, ever present in small chests, is likewise averted by exercise. Gymnastics in dusty rooms are, however, likely

to cause pulmonary irritation and phthisis. The inspired particles may establish or increase pulmonary catarrh.

Houses built on a clay soil should not be chosen for residence. They are less objectionable, however, if the soil has been extensively and completely drained. Dampness indubitably predisposes to, and perhaps excites the development of, phthisis. The *muscular, and nervous, and circulatory systems* are improved by gymnastics and massage. A healthy action of the skin and kidneys is also effected by the same means, for the blood pressure is raised by emptying the veins and filling the arteries.

Balneology and hydrotherapy.—The body must be soaped at least once a day, and the skin kept perfectly clean.

Cold douches, as directed for nasal catarrh, are good tonics. *Sea-bathing* is suitable in some cases, and has a more powerful, bracing, and tonic effect than fresh-water bathing. Certain *foreign* and *home spas* are in high repute for the removal of the scrofulous diathesis. The hot baths of Bath are certainly, with proper precautions, useful in older children. *Chalybeate* waters are drunk for the anæmic states of scrofula. Purgine *saline* waters, especially of Carlsbad and Friedrichshall, are decidedly beneficial in securing the daily alvine evacuation, and in promoting the action of the liver and intestinal glands; they thus cause a general good effect. A wineglassful may be taken by children of seven every morning before breakfast. Sulphuretted waters of Cheltenham and Moffat have also been recommended; also the iodobromated waters of Wiesbaden, Kreuznach, Baden-Baden on the Continent, and Woodhall in England.

The *bowels* must be evacuated adequately once a day. Faulty habits and atony of bowel are the chief causes of constipation in scrofula. Massage to the abdomen is valuable, the hands stroking the belly and squeezing the deep parts always in the direction of peristalsis of the colon.

Tinct. of nux vomica two or three drops t.d.s.; confection of senna or sulphur ʒss. in morning; compound liquorice powder; jalapine gr. ii.; fluid magnesia are suitable drugs. Aloes may be used with advantage either as a pillule of ¼ or ½ grain of aloine, or the old-fashioned decoction ʒii. or more every night. Small enemata* of soap and water are valuable. Large enemata and powerful purgation are to be avoided, because all catarrhs are to be prevented in the scrofulous.

Food must be nourishing and digestible. The mother if consumptive should not suckle her offspring. Artificial feeding is decidedly deleterious. Therefore a healthy wet nurse should be procured wherever possible. Underdone or raw meat, new-laid eggs, cream, fresh cow's milk are good. Carbohydrates should be given in spare quantities. One mealy mashed potato or half the head of cauliflower a day, made into a purée with milk, is good. A little only of well-boiled, thoroughly smoothed rice, sago, tapioca, should be allowed. Boiled greens, spinach, cabbages, cauliflower, broccoli, may be taken in strict moderation. Sweets, jams, candies, preserves, pastry, nuts, cheeses, are liable to prolong digestion, increase decomposition, and develop catarrh. Only the smallest doses of these should be permitted. The *appetite* is most variable even in the same child. A ravenous appetite, or positive anorexia, may sometimes be relieved by a little wine with the meals, sound claret ℥i. or port ℥ss., or a ʒii. of brandy in the water or milk. Or this ten minutes before meals for a child of seven years :—

℞ Sodæ Bicarb., gr. vii.
Syrupi Limonis, ♏xx. t.d.s.
Inf. Calumbæ, ʒii.

Reputed specifics.—*Cod-liver oil* must be given with much thought and great discretion. The physician is armed with numerous weapons. We have absolute control over the ad-

* Two or three ounces.

mission of ingesta. In my experience there is no type or constitution that necessarily contra-indicates cod-liver oil, administered in some form or in some way. I cannot endorse the views of those who draw distinctions between fair and dark, thin and fat children, in relation to the taking of cod-liver oil. Tried with, if necessary, minute attention to details most scrofulous children will take it for months together. There are a *few* children who seem to be unable to derive benefit, no matter what the form or method of administration.

Methods.—The use of gelatine capsules to conceal the taste ought to be more extended. Children "won't," or "can't," take pills, but if the head be held well back, as though a little playful conjuring were about to take place, the words "magic, presto, fly," will enable a pill or capsule to be neatly dropped within the region of the involuntary reflex apparatus for deglutition, especially if the child draws a deep breath of astonishment. The *dose* must be small to start with. Half-a-teaspoonful is a good dose, twice or thrice a day; it may be increased or even further diminished according to circumstances. The *stools* should be examined to see that much oil is not passed undigested. It is not the quantity ingested, but the amount assimilated, that does good.

Times of administration.—The oil should be given after meals. Our object should be to introduce the oil into the duodenum when the duodenal juices are in powerful action. Experiments appear to prove that fats delay gastric digestion. Strictly speaking, the oil should be ingested in time to pass into the duodenum as the last part of the chyme is disappearing from the stomach. This moment most certainly varies in different children. In some of the scrofulous, gastric digestion goes on gaily, and the oil may be given with the meals without weakening the work of the stomach. However, a few simple experiments in each individual will usually quickly enable the therapeutist to find

the time that is most suitable for the administration of the oil. It is easy to understand that a dose of dilute hydrochloric acid with the oil may ensure its more efficient emulsionization and saponification, because the acid given at the end of gastric digestion would serve as a stimulant to the secretions that flow into the duodenum. Occasionally the oil is better borne, and better digested, if given in a large dose only once a day, after the mid-day meal. Rarely it is taken best on going to bed, or after breakfast. The oil may be taken and digested or assimilated best when given with iron wine, glycerine, calumba, or an alkali. An experiment will have to be made in every case of failure with the simple oil alone.

The following are a few prescriptions which may be useful when the oil cannot be taken alone :—

℞ Tinct. of Calumb. ♏v.
Cod-liver Oil, ʒss.
Lime Water, ʒss. t.d.s.

℞ Carbonate of Potash, gr. ii.
Cod-liver Oil, ʒss.
Aq., ʒss.

℞ Cod-liver Oil, ♏xx.
Steel Wine, ♏xx.
Glycerine, ♏xx. t.d.s.

℞ Cod-liver Oil, ♏xx.
Lime Water, ♏xx.
Glycerine, ʒxx. t.d.s.

These doses may be commenced with for a child two or three years old.

Anæmia must be treated with iron in some form. Syrup of iodide, ♏x. to begin with, is useful when there are no lesions, but still more if there be a chronic ozæna.

Iodides are reputed specifics. They promote metabolism or tissue change. With hygienic surroundings, liberal diet and tonics, they may help to bring the scrofulous protoplasm back to normal modes of action. Syrup of iodide, ♏x. to commence with and given after meals, is the best. It may be mixed with water at the time of being taken. It is best not to keep the iodide long diluted with water, because deleterious chemical changes are said to occur. It may, however, cause nausea and biliousness. Iodide of potassium or sodium may be given in 2 grain doses, increased cautiously. Tartrate of iron, gr. iii., is often prescribed with these. Glycerine ♏xxx., or syrup, plain or of tolu ʒss., and water to ʒii., makes a palatable preparation. *Chloride of calcium*, gr. v.-x., in milk after food, four times a day, is specially recommended for scrofulous enlargement of glands. *Sulphides*, especially of calcium, are prescribed for all scrofulous lesions, particularly subcutaneous indurations or tubercles. Ringer states that they hasten elimination of pus and cheesy matter. I prefer surgical treatment for these local lesions. Sulphides are given in fractional doses, gr. $\frac{1}{8}$ or $\frac{1}{6}$ three or four times a day; or gr. $\frac{1}{30}$ or $\frac{1}{10}$ every hour or two. Repeated large doses may cause anæmia. The sulphides are said to improve the general health; other drugs are not employed in conjunction with them. A teaspoonful hourly of a solution of one grain in half-a-pint of water is recommended by Ringer. Pilules are also possible modes of administration. Dr. C. West advised constitutional treatment only for the subcutaneous lesions, and rest by means of splints for hands and fingers. The local rest is decidedly good.

Iodine may be prescribed in the form of tincture or liquor a few minims of either further diluted in water and given twice or thrice a day after meals. Lugol's solution is preferred by some (K I gr. xxx., Iodine gr. xx., Aq. ℥i.) 2 or 3 minims three times a day. These appear to have no special advantage

over oil and arsenic. Iodide of starch in contact with the corporeal juices, liberates free iodine. Two drops of tincture are dropped on starch and given in syrup. I cannot perceive any advantage in this method. *Phosphate* of lime is given in two-grain doses, alone or with one grain of iron. Parrish's chemical food, or Easton's syrup, which contains strychnia, are also used. The syrups sometimes disagree. Hypophosphites of lime and soda probably become phosphates in the stomach. As stimulants to the liver and other organs of digestion, these preparations are of considerable value. *Arsenic* in drop doses after food is certainly valuable in chronic glandular enlargements. It is the most valuable alterative next to cod-liver oil, and may be prescribed with vinum ferri citratis. Small doses of Donovan's solution, Liq. Hyd. and Ars. Iodidi, are also recommended.

Mercury should not be used. Some have claimed that small doses of bichloride or biniodide have benefited obstinate cases.

Surgical treatment.– I advocate surgery extensively for local scrofulous lesions. Chronic glands near the surface, and easily removable by the aseptic surgeon, ought to be extirpated. Induration of skin over them, or adhesions to surrounding tissues, ulceration, discharge, or abscess, are to be regarded as indications rendering the surgical removal all the more necessary. The friendly sharp spoon removes all tubercular matter, and the wound heals comparatively rapidly with a sound cicatrix under the benign antiseptic influence of iodoform, absorbent antiseptic wool, and *lasting* dressings. Ugly scrofulous scars often conceal caseo-fibroid tissue or gland. This may form the starting-point of fresh ulceration at any time. Neat removal by the careful aseptic surgeon is to be advocated. Subcutaneous tubercles, or abscesses not glandular, should be treated in the same way. Accessible tubercular ulceration, and infiltration of mucous membranes,

should also be scraped away with the sharp spoon, on the antiseptic method. The galvano-cautery has been used.

Local treatment.— Hygienic.—All scrofulous lesions should, as far as possible, be protected from the air, cold, and damp. I believe that free exposure to this trinity of causes increases lymphoid hyperplasia. Air favours septicity, and should be rigorously excluded from an open sore.

Large glands in the *neck* are to be protected by a woollen neck wrap, or layer of cotton wool and band of silk. This is done in order to keep the parts constantly at a uniform temperature and prevent chilling of surface. Pharyngo-laryngeal catarrh, which increases adenoid hyperplasia of corresponding glands, is prevented by this means.

Mucous membranes and skin the seat of superficial ulceration and scabs not needing surgery, are treated thus :—The scrofulous thick upper lip, *e.g.* All scabs and crusts should be removed with carbolic oil (1 in 40) as soon as formed. Water should never be used to clean the sores, but sweet or weak carbolic oil. When perfectly clean the raw surface should receive the antiseptic ointment or powder, lotion and dressing. Dry and *lasting* dressings are best, as securing rest, and absence of irritation from air, cold, and wet. Salicylic and iodoform wool are invaluable.

Antiseptics.—*Iodoform*, finely powdered and blown on with the insufflator or a dredger or castor, is the best antiseptic dressing. Some prefer finely powdered boric acid. A dressing with sal alembroth, or weak lotion of corrosive sublimate (1 in 1,000), is preferred by some. All these are good, but I always use iodoform. Perhaps inodorous iodol will replace iodoform.

Scrofulous ozæna is treated as far as possible on the same principles as cutaneous sores. Nasal douches or syringings are of much service. Alum lotion, gr. iv. to ʒi., or corrosive sublimate, gr. x. to Oi., warm, twice a day, are valuable for

this purpose. Nasal douches and syringings are often difficult of application. Some of the lotion may be swallowed, hence the mercurial should be used with caution.

The syphon arrangement is not necessary, as Maw's irrigator is cheap and effective. The great object of all local applications is perfect cleanliness by the removal of all scabs, and by the employment of antiseptics, which also act as curative agents.

Insufflations are preferred by some, but they are apt to cake and form crusts. Finely-pulverized iodoform from a puff or insufflator twice a day, after douching or alone, is an excellent insufflation; but the nasal cavities must be cleared daily, either by forcibly blowing the nose or by douches and syringings.

Ointments are most useful in young children. Iodoform ʒi., eucalyptol ʒi., geoline or vaseline ℥i., make a good ointment, and may be introduced on a charged camel's-hair brush, placed as far up as possible, after scabs and crusts have been removed by soaking in oil or lard, and picked off with forceps or wiped away with lint. The mother should be actually instructed. Many dilute mercurial ointments are employed in the same way, *e.g.*, white precipitate and citrine 1 part to 8 of lard.

The *general* and *tonic* treatment is of the utmost importance. A sea voyage, with the precautions already alluded to, will do more to remove ozæna than any quantity of tonics, but local applications are not to be dispensed with even on the voyage.

Difficult indeed is the cure of ozæna. The stench even may defy treatment. There are many antiseptic lotions, however. It seldom happens that the stench is altogether irremediable. A ʒi. to Oi. of Condy's fluid, or common salt and water, are good douches for children some years old. They should be warm, say 80° to 90°. Children will snuff up this fluid out of the palm of the hand when they repel the

douche. The smell of iodoform is preferable to that of ozæna. Iodoform, indeed, has healing and antiseptic properties for ozæna. Iodol may be tried.

Eczema tarsi requires the removal of eyelashes, the emptying of pustules, and the bathing of the lids with biborate of soda (gr. x. to ℥ii.) of warm water. The bathing should be done repeatedly. The margins of lids should be smeared every night with dilute nitrate of mercury ointment, 1 in 4 or 1 in 8. The stick of nitrate of silver may be used occasionally, and will promote healing.

Strumous ophthalmia needs careful, constant cleansing with dilute boric acid lotion. And a shade for the eye. Atropine lotion to ease pain and photophobia; and some dilute yellow oxide ointment, with atropia, to promote healing.

Vaginitis.—Hot lotions, and syringing, and hip baths are best in the acute stage. They should be used at least twice a day. These relieve dysuria and distress; are cleansing and soothing, and counter-irritants to the inflammation. Many lotions for bathing and syringing are used; they should all be employed as hot as can be comfortably borne. Alum, gr. x. to ℥i.; carbolic lotion, 1 in 40; fresh infusion of belladonna; tincture of aconite, ʒi. to ℥i. water; chloral, gr. x. to ℥i., are all good.

After the acute stage, powders, ointment, and lotions are employed. Iodoform is the best; it should be blown in with insufflator. Most valuable are absorbents—pledgets of boracic lint, salicylic wool, iodoform wool, or well-rung-out lint or wool soaked in 1 in 20 carbolic. These are absorbent and antiseptic. They should be renewed as often as necessary, but they do not replace the other measures. They may be easily placed between the labia, and fix themselves. In irritative eczema from worms, these antiseptic absorbents are simply invaluable.

One part of calomel and three of starch, or this:—

powdered lycopodium 30 grains, subnitrate of bismuth 10 grains, belladonna root powder one grain—has been recommended. Any dilute mercurial ointments are good. Some use complex ointments, thus :

Glycerole of Starch, gr. 25.
Bromide of Potassium, gr. i.
Subnitrate of Bismuth, gr. i.
Calomel, gr. $\frac{2}{3}$.
Ext. of Belladonna, gr. $\frac{1}{8}$.

These are applied by means of a camel's-hair brush. I do not recommend the composite ointment, and have the greatest faith in iodoform insufflation, or ointment made up with a dram each of eucalyptol and iodoform to an ounce of geoline or lard.

A lotion of weak carbolic acid, gr. v. to ℥i., or, better, corrosive sublimate, gr. x. to Oi., of simple or lime water, may, if necessary, be syringed into the vagina by means of a fine catheter. Sulphate of zinc gr. ii. to ℥i., liq. plumbi dil. ; nitrate of silver, gr. v. to ℥i., are also used. Teething, worms, and gastro-enteric derangements should receive attention. A discharge of blood may take place from the vagina much to the alarm of the parent.

Copaiva has been prescribed to relieve the dysuria and distress. It can seldom be necessary. ℞ Bals. Copaibæ, ♏v. ; Liq. Potassæ, ♏v. ; Spt. Æth. Nit., ♏x. ; Aq. Camph., ʒii., for a child four years old. It would be better given in a capsule.

Protracted Otorrhœa is treated of under Otitis. Perfect cleanliness by syringing lotions of antiseptic nature is the first thing. Surgical treatment should not be delayed. These cases must be cured, and that soon. Iodoform powder is good. Counter-irritation by iodine tincture over the mastoid is, I am convinced, valueless.

Counter-irritations and absorbents to glands and joints. —The skin of children is a tender structure, and must not be

made too sore. The liniment of *iodine* may be too strong, and the tincture is generally preferred. The oleate of mercury (5 per cent.) is a cleanly preparation, and may be painted on. *Blistering* fluid is not recommended, though some advocate a frequent application. Some have advised blistering, not over, but at some little distance from the gland. The Ung. iodide of potassium is not dirty, but probably the friction does most good. The local applications are not to be used when active inflammation is present; sometimes an indolent gland may take on a sloughy action under the influence of vigorous external and internal administration of iodine. Counter-irritation, on the whole, would seem to be bad. The large glands owe their existence partly to local irritation. Can counter-irritation remove them, then? But gentle friction may exert a beneficial absorbent action.

LARDACEOUS DISEASE.

Thanks to modern surgery, lardaceous, waxy, or amyloid disease is rarer now than it used to be. Chronic suppurations from bone, empyema, and lung disease (dilated bronchi and suppurating tubercle), are its commonest causes. The syphilitic cachexia may be attended with a fair amount of lardaceous change in the viscera. The chief organs affected are the liver, spleen, kidneys, lymphatic glands and mucous coat of stomach and intestines. Boys after the age of five yield the largest number of cases. The visceral enlargement of liver and spleen are known as painless, hard, smooth tumours that can be felt below the margin of the ribs; or percussed as dulness, extending upwards beyond the usual boundaries of these organs. Anæmia always goes with lardaceous disease. Albuminuria may signify renal change, but may also imply inadequacy of liver to transform the right amount of albumen. The **treatment** of this disease is that of the disease with

which it is associated. But general *hygienic* measures are of vast importance. The patient should breathe as much *fresh sea* air as possible. *Cold douches* (see nasal catarrh), massage, and exercise (see p. 9) should all be used systematically, wherever possible. Alkalis are also highly praised. The chloride of ammonium, 5 grains, is prescribed with a bitter stomachic, either of infusion of calumba or compd. infusion of gentian ʒii. for a child seven years old. Cod-liver oil and steel wine, managed as recommended for scrofula, often effect wonders. So also does the syrup of the iodide of iron. Or three grain doses of iodide of sodium given with ten drops each of spirits of chloroform and glycerine in ʒii. of compound infusion of gentian for a child five years old. The iodine preparations are most valuable when there is evidence of syphilis.

The *diet* must be regulated in harmony with the powers of the stomach and pancreas and other digestive glands, and with due regard to the state of the bowels. The indications will be found under the head of scrofula, empyema, indigestion, and diarrhœa. A little high-class port wine, ℥ss. with the meals, is often of conspicuous value. Claret ℥i. may answer better. It will be gathered that this disease in children is by no means an incurable one.

Dropsy is to be treated with iron, for it is largely dependent on anæmia. Tincture of the perchloride ♏v., or exsiccated sulphate of iron gr. ii., may be given with twenty drops of glycerine in peppermint water. *Cardiac tonics*, digitalis, squills, strophanthus, and the like increase the amount of albumen, and are not as a rule suitable. Any tendency to dilatation of myocardium should be warded off by rest in the recumbent posture, feeding, and alcoholic stimulants, rather than by special heart tonics. *Purgatives* that reduce the strength should never be used. A small dose of castor oil ʒss., or rhubarb and soda gr. x., in a capsule, or compound liquorice

powder ʒss., or decoc. of aloes ʒii., fluid magnesia, ℥i., Friedrichshall ℥i., every morning if necessary are best. The doses are for children five years old.

TUBERCULOSIS.

Fatal cases of febrile illness having a variable duration are met with in young children, in which the symptoms often fail to indicate disease in any special organ. After death nodules of miliary tubercle are found uniformly scattered throughout the three great cavities of the body. The *physical signs* during life are of an indefinite character, rendering a diagnosis of the seat of lesion impossible. The child is frequently out of health for some months before the illness can be regarded as serious. Whether this period of malaise is merely to be attributed to a faulty protoplasm or constitution, to a mere general debility, or is already the result of the deposition of tubercles, must remain a mystery. One thing seems clear, that infants are born with a proclivity to become the subject of these general morbid processes. In some cases there is nothing but the general tuberculosis to be discovered. The disease sets in with no more reason than typhoid fever begins. In other cases it is the immediate *sequel* of whooping cough, measles, typhoid fever, or some other illness. Immensely important is it as a principal part of prophylactic treatment to guard against these complaints. And in yet other cases no immediate cause can be discovered; here the necropsy reveals the presence of a large, evidently ancient cheesy gland, which may be regarded as the source of the infective process. The so-called scrofulous protoplasm or diathesis is especially prone to develop this general process of tuberculosis.

Treatment—*Prophylactic—Hygienic.*—The precautions to be taken in the general care and attention of the scrofulous are equally needed for those children whose parents are of

tubercular stock, if not themselves actually tuberculous. And the supervision of all matters relating to the nervous, muscular, respiratory, circulatory, excretory, and digestive systems must be carried out with the same assiduity. (See Scrofulosis.)

Even supposing that the bacillus is not the efficient cause of tuberculosis, no harm can be done by treating the child on the basis that Koch's theory is true. We then think always of *soil* and of *bacillary* infection. The soil is the protoplasm of the child. We must attend to the health of this protoplasm—place it in the most favourable circumstances so as to enable it to defend itself against those influences which are known to deteriorate it. And we ought specially also to guard against the introduction of the bacillus. Hence the advisability of its not breathing air loaded with particulate matter, and organic emanations especially from the *poitrinaire*, and thence its not living in town or city, but on the sea or sea coast, or at high altitudes. Excessive *moisture* is probably favourable to the growth of the bacillus, and is certainly deleterious to the health of the organism in general. On all these scores a well-drained country residence for as long a period of the year as possible is the treatment. Variation and attractiveness of diet, to tempt the appetite, is an important item in treatment.

The *diagnosis* of general tuberculosis is only to be guessed at with some degree of probability, unless definite signs appear in some organ or other. But of these cases with physical signs I shall write again. Typhoid fever, and repeated attacks of gastric or enteric or bronchial catarrh are most likely to be mistaken for the general tuberculosis. The symptoms consist of languor, variable fever, *often irregular* in its chronology, cough, diarrhœa, constipation, ravenous appetite, or loss of appetite, mental depression or unwonted liveliness, vari-

able pulse rate and alterations in respiratory rhythm, emaciation and anæmia. If these symptoms have run on in straggling fashion without high fever for more than a month, then the diagnosis should be made, and will not often be erroneous. The "tubercular" aspect increases the probability of the diagnosis—tall, slim, fine skin, bright eye, long eyelashes, downy hair on back, long straight limbs, small chest, and active habits.

The *diet* and *stimulants* required in acute tuberculosis must be of the kind required in all acute febrile diseases—beef tea, mutton broth, milk, and barley water, Mellin's food, brandy and egg mixture, meat juice, &c. There are no special indications beyond the necessities of the case and the complications. The treatment of this morbid process apart from the general management already indicated has hitherto proved hopeless. But it must not be supposed that tubercle is necessarily fatal. Probably general tuberculosis is always so. But it is certain that tubercles become obsolete, more especially in children, and there are no means of knowing whether these cases have been of the widely disseminated class, or limited to the confines of a few organs. The mother should nurse her offspring for more than 12 months, but the presence of maternal tubercle should prohibit suckling. Having laid the greatest stress on the need for general treatment, we may sum up the other remedial measures by saying that each symptom must be treated as it arises.

Expectant treatment.—The various catarrhs are to be attended to on the principles and details of clothing indicated so frequently in this book. Restlessness, sleeplessness, altered appetite, and so forth, must receive all the medical care and comfort of which the practitioner is master. A word may be put in for *arsenic*. It may be given even when cod-liver oil and iron are also being taken. Arsenic is unquestionably attack all parts of the body, and exercises

some influence on the vital processes; it does tend to *alter* these processes. It has been highly recommended in tuberculosis, and I am disposed to think that it is of some value. Drop doses of the liquor, or Fowler's solution, given after meals, is the best method of administration. It may be gradually increased in quantity, but should never be pushed to the extent of causing nausea, ocular irritation, or puffy eyelids. Arsenic is said also to reduce the fever. The treatment of pyrexia in acute tuberculosis calls for the use of those means usually adopted for the reduction of fever. (See Antipyrexia.)

Specifics so much vaunted have proved invariably valueless so far; but we can kill the syphilitic virus, why not that of tubercle? If our present pathology is right there is hope of this. *Iodoform* in half-grain doses in capsule, or with sugar of milk, has been tried freely. It should be given cautiously, for it is apt to induce unpleasant and even dangerous symptoms, though some children bear it well. *Quinine* sulphate or tannate may be given in ten-grain doses occasionally, for a boy five years old, if there be high fever (104°); it may have no effect, or only a temporary one. *Salicin* gr. iii., and salicylates gr. iii., or small doses of quinine, given regularly, have all been tried, but they are valueless. Large doses of salicin preparations exercise no permanent influence. *Hypophosphite* of lime, soda, or iron, in two-grain doses three times a day, for a child four years old, after meals, have been recommended. They are of no value in acute tuberculosis, in my experience. *Phosphorus* in gr. $\frac{1}{100}$ doses has been occasionally used on the same theory that arsenic is given, viz.: that it has some action on tissue change. No good appears to have resulted from its use.

Bichloride of mercury, prescribed as in syphilis, has also failed. Terebene and turpentine, in five-drop doses, in syrup, honey, glycerine, or capsule, have been used.

INHERITED SYPHILIS.

Seldom does the syphilitic disease show itself at the moment of birth. It would seem as though the infant must be exposed to the accidents or circumstances of extra-uterine life before the dormant disease can awaken into activity. Whether this is dependent on the new mode of alimentation, on the introduction of the new mode of respiration and oxygenation of blood, or on what, we have not yet discovered. Stillbirths are not evidence in themselves of the syphilitic process having been at work in the fœtus. There is death, but that may be due to many causes than actual fœtal syphilis. There is no question, however, but that syphilitic lesions do occur in the fœtus. Pemphigus neonatorum, the bullæ coming out on the palms and soles and elsewhere, may occur within a week of birth, and is of serious prognosis. It is doubtful whether pure syphilis delays closure of the anterior fontanelle. Of the coryza, with snuffles, stomatitis, and sores at the angles of the mouth, of the anal excoriations and ulcerations, of the "hammy" rash on the buttocks, hams, and calves, of the hoarse cry, coppery scaly cutaneous areas in every part of the body, no further description is necessary in a work of this kind. The enlarged spleen, which may increase in size whilst other syphilitic phenomena disappear, may be of help in diagnosis.

Syphilis leaves no organ, no tissue untouched in the infant and child. We need be surprised by no lesion in inherited syphilis.

It affects the lungs, the heart, the liver, the spleen, the bones, the lymphatic glands, the arteries, the membranes, and the brain.

"*Syphilitic pseudo-paralysis*" is essentially a morbid process at the end of the vascular shaft just where it joins the epiphysis; it is a symmetrical disease, and affects infants almost always under ten months of age. It may lead to separation of the epiphysis, and even to suppuration in the

joint. There is some swelling about the periosteum in the neighbourhood of the diseased growing end of the bone; but the swelling is situated a little farther away from the joint than that of rickets, and the disease does not affect the cartilage so much as it does the vascular bone; its chief seat is on the shaft side of the calcified lamina of cartilage. The paralysis results from the tenderness and pain on movement, and from the separation of the epiphysis. There is no alteration in the faradic reactions of the muscles about the part, and when the knee region is affected, the knee jerks in some cases are even exaggerated.

Other syphilitic lesions.—The dwarfed and notched central incisors, chiefly the upper (resulting from want of development of the middle denticle); the dome-shaped molars, the thickened clavicles and tibiæ (nodular or diffuse), ulnæ, and fibulæ (external malleolar region); the depressed root of nose which may be seen in the early months and perforation of septum, the frontal and parietal bossy growths (from few months to some years of age), the cranio-tabes (early months), anal condylomata (rarely seen before twelve months), interstitial keratitis, iritis, and disseminated choroditis; necrosis of palate and obliteration of passage between posterior nares and pharynx, ulceration of larynx and chronic laryngitis with great tendency to relapse, are important items in inherited syphilis, and are met with mostly in children some years of age.

Syphilitic ulceration of the lingual *frænum* was once shown me by a mother in her first child a month old, which she brought for *hooping cough*. One week later a black eruption spread all over the skin and mouth, and death followed.

I have asked myself the question whether inherited syphilis in the children of parents who have worked in lead is not usually severe?

Of the white *hepatisation* (so-called pneumonia) of the

lung in new-born syphilitic children, and in those a few weeks old, I have seen several examples. And circumscribed areas having characters which can be mistaken for those of gummata have been found, and also there is a more diffuse syphilitic fibroid overgrowth. Similar changes occur in the *heart*, *kidney*, *liver*, and perhaps the *spleen*, though the enlargement of the spleen is usually a general one. Miliary gummata are mere collections of the cellular overgrowth. Sometimes there is evidence of genuine gummata subsiding —retrocedent gumma in the liver (Dr. Barlow, "Path. Trans."). *Ascites* occasionally occurs in syphilitic infants.

I have a specimen of great atrophy and widespread sclerosis of *brain*, with thickened arteries of *typical* description, from a child three years old. (See "Brain," 1883.) Gummata have been seen on cranial nerves. Paralysis of limbs from syphilitic infiltration of nerves has been described, remediable by mercurial inunctions.

Diagnosis is seldom difficult in the first weeks of life. If a child is ill at this period, *bad feeding* and *syphilis* should never be absent from the practitioner's mind. The syphilitic cachexia with its old-looking face is all well enough when it is present, but it is more frequently absent in the majority of syphilitic infants that come under my care. Often, indeed, chronic snuffles and sore bottoms, with a few coppery or dry scaly spots about the body, are the only evidences of syphilis; the infant may even appear otherwise in perfect condition.

Cylindrical finger and toe nails having a yellow staining, suggestive of nitric acid, in which tint the soles and palms may participate, is never seen, I believe, without there is profound syphilization of the infant. Here we see a parchment-like skin of dusky tint and shrivelled aspect, and a dry scaly eruption about the moustache and beard region. Then is the most frequent occasion for finding hard swelling of both testicles, with or without hydrocele.

"Wash-leathery" looking patches and also serpiginous ulcerations, are met with on, and gummata in, the *tongue*. These coexist at times with cachexia, and at others without serious general illness. They may be seen during the first few months, or as late as the tenth year, and perhaps later.

A fatal case, in an infant five months old, of interstitial *hepatitis* that I observed, had epistaxis, hæmatemesis, and melæna as its chief symptoms; not much emaciation, great anæmia, slight ascites. The elder brother of this child, aged four years, had *hydrocephalus* and *bossed* skull, and is still improving under treatment. Syphilis is a cause of hydrocephalus which is then not unfrequently cured by mercurial inunctions best applied to the head and neck. Syphilitic *ascites* occurs in infants a few weeks old; the liver need not be enlarged; sometimes a large gland in the portal fissure is the mechanism. I have seen at least one extreme case of syphilitic ascites cured by mercurial inunctions and careful feeding; there was a dry, scaly cutaneous lesion in this case. The septa or bands of Glisson's capsule may be specially affected and jaundice may result (peripylephlebitis syphilitica).

The **treatment** of syphilis does not consist solely in the administration of mercurials and iodides. The *diet* is a most important matter, and attention to it, and to the general *hygienic* wants of fresh air and careful clothing, will often do much to remove syphilitic taint and lesions without the aid of specific medicaments. Cod-liver oil (see scrofula) is of the utmost value. If the mother seems healthy the child should be kept at the *breast*, and all artificial feeding interdicted. It would be well to examine the maternal milk in order to ascertain so far as possible its quality. If the milk be not good artificial rearing will have to be substituted. Where cachexia is marked a cotton wool dress from head to foot, and in cold weather the employment of the

mechanical nurse, to prevent death from cold, should be recommended. No child is more susceptible to the influence of bad air, bad food, cold and damp, than a syphilitic infant. Therefore the nursery and out-door arrangements are of tremendous moment. A syphilitic infant needs fresh food; it will more readily become scorbutic than another if fed on condensed milk and artificial foods of the usual description. Dilute *raw meat juice* is specially valuable. When the child goes out of doors in fine weather it must be kept warm by woollen clothing, and hot bottles in the perambulator if necessary. Again, during the heat of the day the shade must be sought, but the shady position must not be a cold one.

A child that is bodily ill with syphilis cannot be fed too carefully. His welfare will require all the dietetic art of the practitioner. The stools must be examined to see that no curds, or fat, or starch are being passed undigested. Vomiting must be checked, and also diarrhœa or constipation—not that there are any very special remedies needed in this disease to control such symptoms. Blockage of the nostrils from scabs is easily treated by soaking the scabs away with sweet oil, never using water to the sores, and treating the raw surface with iodoform ointment, some of which may be placed far up the nasal passages with a fine camel's-hair brush. Great obstruction of the nasal passages from infiltration and scabbing prevents the child from sucking efficiently. It must then be fed with a spoon or syringe. Active treatment of the kind described should be used for the nose, in addition to the mercurial medication.

Something is due to the attendants on the child, who should be warned that they may take the disease. Any abrasion or wound on the attendant's fingers must be carefully guarded. None of the infant's nursery linen should she use for her own person. All this linen must be washed at home after careful disinfection in Condy's fluid ʒii. to Oi.,

rinsed in cold water afterwards to prevent staining, or carbolic lotion 1 in 40. The *parents* must be treated for the complaint, which should always be explained to both of them. Most of the mothers that I have seen in private practice are perfectly alive to the nature of the disease, and there need be no false modesty about the matter. Let the danger be faced, not shunned. Of course common sense in social matters should be one's guide.

I cannot enter into the question whether the maternal milk contains the syphilitic poison, nor into the discussion of the different modes in which the fœtus may become infected. A syphilitic infant may infect her nurse, as I have said, and wet nursing cannot, therefore, be allowed.

Great care is needed in the administration of mercury. Most infants take a grain of that most constant mercurial preparation *Hyd. cum Creta* three times a day without inconvenience. Vomiting and green stools several times a day are indications for altering the mode of administration. A little bismuth trisnitrate, gr. ii., or prepared chalk, gr. ii., may be added to the mercurial powder, which should be stopped altogether, however, till the signs of irritation have subsided. Sometimes Dover's powder, gr. i., is needed if excessive peristalsis and restlessness be present. The practioner should feel his way cautiously.

The *liquor hydrargyri perchloridi* (Van Swieten's is like this) in ♏xx. doses t.d.s., increased to ʒss. or diminished still further, may prove the best. It may be given after meals in aromatic water or decoc. of sarsaparilla. *Calomel*, even in minute doses, of gr. $\frac{1}{12}$ four times a day, may occasionally suit the best, but it is usually more irritating to the bowels than the other preparations, and also depressing to the nervous system.

The *ointment of mercury*, made with lanolin especially, is a most serviceable preparation for inunction. The homely

flannel binder may be used when the effects are required for the system at large. But if any organ be the special seat of disease the effect, especially of the penetrating lanolin preparation, is often very surprising, *e.g.*, an inunction over the larynx or into the head or scrotum when these respective regions are the chief seats of disease. Great care is necessary not to overdo the inunction. At first there can be no harm in using a little every day. Infants seldom become salivated or suffer from any form of mercurialism. The effect of the inunction is greatly enhanced by the use of warm soap and water which is also necessary for the purposes of cleanliness; the old ointment should be cleared away with soap as much as possible before a fresh rubbing in takes place. The hyperæmia of the surface, resulting from the soap cleansing, and the removal of grease from the cutaneous orifices, are useful in aiding the absorption of the finely particulate mineral.

Extreme *ascites* in the syphilitic infant may be recovered from. Hyd. c. Cret. gr. i. three times a day should be given internally, and blue ointment infricted daily into the belly. In the case referred to the ascites lasted four weeks and did not return.

For the *debility* and *arrest of growth* that result from syphilis, and for most syphilitic lesions occurring after the first year of life, the employment of cod-liver oil and iron, or of the syrup of iodide of iron, is an efficient mode of medical treatment. But sea voyages and the other general treatment are highly important. (See scrofula). *Arsenic* also is of some value, given in drop doses with dram doses of steel wine after meals.

For the painful enlargements of the tibia and other bones iodide of potassium is most useful in large doses—gr. v. to begin with, for children 7 years of age—with decoction and liq. ext. of cinchona. Chloride of ammonium may be prescribed with the iodide, especially in cases of hepatic disease.

℞ Pot. Iod., gr. v.
Ext. Cinch. liq., ♏v.
Syrupi Aurantii, ʒi.
Inf. Cinch., ℥ss. t.d.s.

or ℞ Pot. Iod., gr. v.
Ext. Sarsæ liq., ʒss.
Decoc. Sarsæ Co. ad., ℥ss. t.d.s.

But a little mercury continued for a few weeks is occasionally needed. Interstitial keratitis does not appear to be benefited by specific medicaments, though they are generally prescribed. Avoidance of cold, of daughts of air on the head or eyes, is an important prophylactic.

Calomel is sometimes used as a dressing to syphilitic *condylomata* and *fissures*, but I prefer iodoform. The sanitary rose powder of boric acid is highly prized. I have not used carbolic acid or chloride of zinc to syphilitic sores in infants or adults, and never wish for anything better than the iodoform powder after the usual cleansing. Obstinate condylomata are touched with nitrate of silver. All scabs and secretions must be removed with lard, or oil and wool, or forceps.

Warm *baths* of corrosive sublimate have been employed for the treatment of inherited syphilis. A convenient bath may be made of ʒi. of the salt to two gallons of water. I have used it in two cases for a few days where most other preparations disagreed. Finally, I returned to the inunction of the blue ointment.

My own practice is to discontinue the use of mercury as soon as all local signs of the disease have completely disappeared. The spleen may be enlarged still, but of that I take no notice. When the mercury is left off I trust to careful nursing and diet, and fresh air, and cod-liver oil. And if a fresh sign appear renew the mercury. This method I believe to be preferable to the long continuance of mercury after the subsidence of all manifestations. My principle is that many

syphilitic children have sufficient strength and vitality in their growth and development to throw off the disease. Not that I use mercury less, but that I like nature and general means more. As a matter of fact, often my patients take mercury for months together, but that is chiefly in out-patient practice, where the removal of unhygienic conditions is so difficult.

Other local remedies to syphilitic sores in children that may be used are the red oxide of mercury and nitrate of silver; doubtless they are equally efficient with the iodoform ointment, provided they be used discreetly.

Syphilitic perforation of palate and ulceration of fauces requires constant local applications to ensure cleanliness. Sprays of sanitas or alum lotion, gargles of chlorate of potash, syringing with weak solutions of Condy's fluid, removal by forceps of obstinate shreds and exudations. These means will also promote healing. Painting the cleansed ulcerated surface with nitrate of silver (gr. x. to ℥i.) and blowing iodoform on it with the insufflator are very valuable.

Dry eruptions need simple cleansing and internal treatment. If obstinate, some lanoline mercurial may be infricted. Oleate of mercury, five per cent., is also used, diluted three times with olive, or better, carbolic oil, 1 in 40. Blackwash is a useful local application to wet eruptions, but I prefer to use no water.

RICKETS.

Two peculiarities or specialities of children are the excitability of the nervous system, and the liability to catarrh of mucous membranes. In rickets the child is doubly a child if we think of its nervous system and its liability to catarrh. The bone changes and new formations, though most evident, are far less important *qua* the life of the child than the *catarrhal complications*, the *muscular debility*, and the *neurosal liabilities*. A rickety infant is liable to fits

of the whole body, to tetany of the extremities, and to spasm of the larynx. It is also prone to naso-bronchial, gastric, and enteric catarrh. Its muscles are no better than its nerves. Both are *weak* and *irritable*. The whole protoplasm of the body is bad in rickets, and this is the result, not only of bad diet, but bad air and other hygienic defects. Now, the liver and the spleen are also said to be the seat of rickety enlargement. True, these organs are found enlarged when other true rickety changes are present. But I have asked myself whether rickets *pure* and *simple* does enlarge these organs. My notes of cases would seem to lead to the conclusion that in these cases syphilis is co-operative. I will not say more than make this suggestion.

The "*bossing*" of the cranial bones, which Parrot put down always to syphilis, is doubtless frequently due to that diathesis, but I have notes of a few cases in which syphilis appeared to be excluded, but in which the frontal bones were very thick and typically bossed.

The *diagnosis* of rickets is usually the easiest problem in diseases of children. Nocturnal restlessness, sweating about the head, and inability to walk, or weak legs, with large wrists, beaded ribs, and weak spine, the back being convex backwards (cat's back), are sufficient indications. The disease usually starts before the child is one year old. But cases do occur later. And the disease called "*late*" rickets, occurring in children even over seven years of age, sometimes as the result of an acute illness, would appear to be well named. At all events there is in some of them that irregular overgrowth of the cartilage of the epiphyseal line which is regarded on all hands as an essentially rickety change. "*Fœtal*," or "*congenital*" *rickets*, due to changes in the bones during intra-uterine life, is certainly not of the same nature as true rickets.

Craniotabes "parchment crackling" of skull bones, or partial

wasting of the bones of the skull, so that all the earthy matter is removed, is a rickety as well as a syphilitic phenomenon. These areas or spots of atrophy of bone are felt about the region of the posterior inferior angle of the parietal bones. They do occur in other parts, and even rarely in the frontal bones. The atrophy is due to bone softening and to pressure of the head against the pillow, and of the brain against the bone. There is on the inner aspect of the calvaria, around the margin of the atrophied bone, a little sprinkling as of sand, which is a little scattered overgrowth of bone. It is an illustration of the well-known pathological law that where atrophy is there also is hypertrophy; for the same cause in a lesser degree causes overgrowth, and in a greater degree undergrowth or atrophy.

A good deal has been said of *tenderness* in rickets; Sir W. Jenner said the muscles of the thigh were as tender as those of the abdomen. Tenderness does exist in true rickets, I admit, but the practitioner will see hundreds of cases of rickety infants without once being struck with the tenderness of their bones or their muscles. *Scurvy* complicating rickets, with effusion of blood into the periosteum, is a tender complaint, and there will be no mistake about the tenderness in these cases.

The rickety "*rosary*," beaded ribs, anterior nodorities, are sometimes associated with *posterior nodosities*, situate about the angles of the ribs. Perhaps these begin as spontaneous fractures, or the strain on the ribs may be greatest here. The ordinary beading is most evident in the 5th and 6th ribs, and on the visceral more than on the cutaneous aspect.

The skull in rickets is said to be large and peculiarly shaped, dolichocephalic with square forehead. Dolichocephaly means much longer than broad, but the opposite condition, brachycephaly, may obtain. The anterior fontanelle frequently does not close at the right time—two years of age is an average period for its final closure. The margins

of the flat bones of the skull are sometimes thickened, and the sutures then appear as furrows.

The *teeth* are cut late in rickets. At times the child has only two instead of twenty at two years of age. Sometimes a year goes by before the first tooth is cut. The face, and especially the lower jaw and chin, are poorly developed in rickets. The *systolic murmur* audible in many cases of rickets about the anterior fontanelle, is of no practical value. There is sometimes an excess of fluid in the ventricles, and occasionally in the subarachnoid space. "Albuminoid" infiltration of the frontal lobes of the brain is due to anæmia and œdema; not to a special material. Large brains may occur in rickets; their histology is still imperfectly known. The relations of rickets with osteomalacia are obscure. In many cases of rickets there is a process of rarefying (?) osteitis, rendering the bone soft. Billroth describes osteomalacia as fungous, fatty, osteomyelitis, which means an atrophy of bone with the development of fungoid granulations some of which become fatty. This would put the process on a par with rarefying osteitis, were it not that Rindfleisch asserts that in osteomalacia the salts are first dissolved out and the soft parts of the bone remain a little longer. I have seen this appearance in some cases supposed to be simply rickety. Further, osteomalacia differs from rarefying osteitis (caries) for the bony trabeculæ instead of being turned into sharply gnawed edges at the site of the disease, gradually grow thinner and thinner, but retain their smooth surface. (Halisterischer bone atrophy of Volkmann.)

Kassowitz contends for the so-called decalcified parts being really new formations, hyperplasia and not inflammatory.

An interesting paper on the relations of rickets and osteomalacia was read by J. S. Bury at the British Medical Association, Liverpool, 1883.

Rickets and *syphilis* may certainly work together in the

same organism. I do not believe with Parrot that all rickets is a final expression of syphilis. Tubercle and rickets occasionally co-exist. Mothers who have produced rickety children require medical attention, and a wet-nurse should be procured.

The **treatment** of a rickety child frequently requires minute attention to details. The stomach has contracted bad *habits*. Re-education of it may be wanted. The *diet* must be set to rights. It is particularly necessary to ensure fine division of all food. Hence minced meat, pounded chicken, and milk guarded by mucilage (see general rules for feeding) are good. A little good wine is valuable. The child must be restricted in its sugar as well as in its starchy food. Both cause acidity from fermentations.

Mellin's food and other malted foods are valuable, because their starch is partly predigested.

If there be diarrhœa, this must be controlled. The *stools* should be examined. As a rule they contain much slime and undigested starchy matter, as may be tested with iodine and examination under the microscope, are extremely offensive, acid. Careful regulation of the quality, quantity, and times of giving the food, as elsewhere laid down, will often alone be sufficient to remove the diarrhœa. The Mist. Ol. Ric. will also be found of much value.

℞ Olei. Ricini, ℥v.
Mucilag. Tragac, ℥xv.
Syrupi, ʒss.
Aq. Menth. Pip. ad ʒj. t.d.s. for a child a year old.

If acidity be not thus overcome—it is usually, however, due to fermentation and undigested starch or fat—some bicarbonate of soda, with rhubarb, may be prescribed. If the number of stools be more than two or three a day, a drop of tinct. opii will correct the excessive action. Sometimes *con-*

stipation is present; its causes are often the same as those of the diarrhœa. A dose of compound liquorice powder to commence with, and the rhubarb and soda mixture to follow, three times a day, will usually overcome constipation. Sometimes a dram or two of the compound decoction of aloes may be prescribed with advantage at night-time.

There is a necessity for abundance of *fresh air*. The child should go out every day if possible, and not in a closed carriage. The nursery must be ventilated day and night, summer and winter. There should be plenty of *light* also, and scrupulous *cleanliness* in the nursery. Well aired should the bed be every day, and the bed linen frequently changed. The clothes must be suited to the weather; the surface of the body should be uniformly protected; a close-fitting flannel jacket or binder for the abdomen is a useful precaution against rickety diarrhœa. It should be seen to that the clothes at night-time are not insufficient. It is best to have the child clad in a combination flannel, or woollen or knitted garment, reaching up to the neck and covering the whole body, legs, ankles, and feet. If the bed clothes get off then it would not matter. The nursery must be large enough for the requirements of nurse and child—at least 2,000 cubic feet, and then ventilation must be secured. The child should be removed from its mother's breast if still being suckled and more than a year old. Careful *cleansing of the skin* every morning and night must be practised, soap being used at least once a day, and all over the child. The underlinen and flannels require frequent changing, for the body sweats profusely sometimes, though generally not so much as the head.

Cold douches are very beneficial. If the circulation be defective, the feet may be placed in hot water and the cold water sponged over the head and trunk. A hot bath (temp. 98° F.) every day of *nitro-hydrochloric acid* has also been

employed—six drams of the nitro-hydrochloric acid to six gallons of water.

Massage—moderating muscular debility—is very useful in rickets; it should be done all over the body. The limbs should be rubbed upwards, the muscles everywhere squeezed gently and stretched out between finger and thumb. Neat's-foot oil or olive oil may be used to do the massage with. *Galvanism* has been used to the weak legs (mothers often bring them for the paralysis), but children cry so much that it is best to trust to massage, for this is soon borne with equanimity, and there is no actual paralysis. The *inunction of oil* certainly does good in itself. And cod-liver oil is frequently thus administered; it is malodorous, and discolours the skin. The inunction is best made fasting, to ensure more complete absorption.

The administration of *cod-liver oil and steel wine* is important. A half dram of each, twice or three times a day, for a child a year old, is the general rule; but the motions should be watched carefully, to see whether the oil is passed away undigested. And if so, the quantity of oil must be reduced. Sometimes the oil will not agree. (See Scrofula.) Salt on the tongue (a pinch or so) may prevent its repeating. Sometimes it is better borne if given with an alkali, carbonate of potash gr. ii. to one of Ferri et Ammon. Cit.; this may be the case if there is acidity of the intestines.

Instead of iron wine or syrup of iodide some prefer *syrup of lactophosphate of iron and lime.* Some again object to syrupy preparations on the ground that they favour fermentation, acidity, diarrhœa and indigestion.

There are very few children who do not prosper on the *vinum ferri.* But dried sulphate of iron in gr. ii. doses or tinct. ferri perchl. ♏ii. each three times a day, may occasionally suit the child better, especially, I think, if it be very fat and flabby.

Diarrhœa.—Some prefer a preliminary saline purgative of alkaline sulphates, or fluid magnesia. Mist. Bism. Alk. is a useful antacid and calmative.

℞ Bismuth Subnitr., gr. iv.
Sodæ Bicarb., gr. iv.
Pulv. Tragac. Co., gr. iii.
Spt. Chlorof., ♏ii.
Aq. Carui, ʒii. t.d.s.

A drop of opium tincture may be added.

Convulsions, laryngismus, and tetany.—Hygiene is of the highest importance, also abundance of fresh air and great cleanliness. Removal of any reflex irritation is an important rule. Cold douches are to be used—properly regulated to the strength of the child, and with due regard to intestinal and bronchial conditions. Sedatives of chloral and bromides are good. (See special sections).

General restlessness, due to peripheral intestinal irritation, as well as to the morbid nervous system, in the early stages is treated by alkalis (Mist. Carminativa).

℞ Sodæ Bicarb., gr. iii.
Spt. Am. Arom., ♏iii.
Glyc., ♏x.
Aq. Menth. Pip., ʒii. t.d.s.

Some prefer fluid magnesia, ʒi. or ʒii. t.d.s.

Bromides and chloral may be used; or the wet pack.

Rickety bronchitis requires great care. And the section on bronchitis should be consulted. Stimulant not depressant treatment should be adopted. Collapse of lung, with its cardio-pulmonary consequences, is *the* danger.

The *copious perspiration* of head and neck have been treated locally by liniments of belladonna, and by the internal administration of drop doses of liquor atropiæ. I have never used these remedies here and have generally contented myself

with bathing the parts with dilute nitro-hydrochloric acid or vinegar ʒi. to Oi. of water.

Phosphorus given in minute doses has been frequently employed in rickets. It should not be given in larger doses than gr. $\frac{1}{100}$ (dissolved in sweet almond oil) to a child a year old. A minim of the phosphorated oil may be prescribed thrice a day; it may be increased to two minims. There is no question that in animals these doses of phosphorus increase the activity of osseous growth, and Kassowitz and others have asserted their beneficial influence in rickets. It may be given in cod-liver oil. ℞ Cod-liver Oil ʒiiiss.; Phosphori, gr. $\frac{1}{6}$. ʒi. t.d.s.

A favourite prescription with the Germans is called linctus gummosus phosphoratus.

℞ Ol. Amygd., ℥i.
Phosphori, gr. $\frac{1}{6}$.
Pulv. Gum Arab. } aa. ℥ss.
Sacchar. Alb. }
Aq. Destil., ℥iss., ʒi or ʒii. t.d.s.

Phosphate of lime, in two-grain doses three times a day, may be prescribed. It constitutes an important part of Parrish's chemical food. If the child is at the breast the nurse may take five-grain doses three times a day. I have used this salt in combination with cod-liver oil with good results. *Syrup of iodide of iron* may be used in ten-minim doses three times a day, especially where there is a running at the nose or syphilis has been present. *Small doses of tannate of quinine*, gr. $\frac{1}{2}$ or gr. $\frac{1}{4}$ of the sulphate, are also recommended four times a day for a child a year old; it should be given in glycerine. Both these agents are antiseptics, and the beneficial action, to which I can bear personal testimony, is probably due to antiseptic influence.

Lime water and carbonate of lime (five grs. of the powder thrice a day) is said to improve the nutrition. This is very

doubtful. Its beneficial effect in rickets is solely attributable to its removing acidity and relieving diarrhœa by its astringency.

The treatment of the *bone* deformities comes within the province of the surgeon. But the physician should recommend the child to be kept off its feet. And if there be slight deformity, putting a padded splint between the legs and binding the latter to it with a flannel roller at night-time may be ordered. For *loose ligaments* the general tonic treatment must suffice, but massage improves their nutrition, and alternate jugs of hot and cold water followed by friction with a flesh glove is useful.

Prevention of deformities.—The bed should be made of firm smooth mattress and no high pillows. Sitting up or walking for any length of time should be prohibited till the bones are consolidated. Splints do but increase muscular weakness in the active stage of rickets.

Osteomalacia.—Softening and great thickening, from new formation, of the bones occurs in childhood in hereditary syphilis.

In cases of so-called osteomalacia of childhood the question is, are the changes due to rickets, to syphilis, to both combined, or are they dependent on other causes?—rickets and syphilis having nothing to say in the matter. Cases have been described by Rehn, in which the whole skeleton, but especially the long bones, were softened, flexible, and thinned; there was some characteristic enlargement of the junction of shaft with epiphysis; fractures easily occurred; craniotabes was sometimes present. Sweating without fever, sometimes splenic enlargement, and in all anæmia and emaciation were present. Restlessness and sleeplessness, with tenderness on movement, were features of the early stage. The children were under two years of age. Thus it will be seen that there were plenty of the characteristics of

rickets in these cases, whose clinical history lasted several months, and sometimes ended favourably, so far as is known. The bones were thickened in places by the formation of massive porous bone. In rickets we also get new formations of osteoid tissue beneath the periosteum. Animal rickets is also characterized by softening of bone and deposits of new porous osseous material. The treatment of osteomalacia consists in taking care that the bones are not injured, and in supplying good nourishment—in fact, the treatment of rickets.

Fœtal rickets or fœtal cretinism.—Large head, large belly, thick stunted limbs, depressed nose root, and abundant formation of subcutaneous fat are features of the fœtal rickets, which so far looks like cretinism. The thyroid gland may be normal or enlarged. There is none of the characteristic cartilaginous digitation as seen in rickets at the junction of shaft with epiphysis. A fibrous lamina intervenes between shaft and epiphysis, and this has grown in from the periosteum. Premature anchylosis of basisphenoid and basi-occipital is found as in cretins. The membrane bones are well formed, or indeed overgrown with hyperplasia. The brain may be deformed as the result of the shortening of the basis cranii and the over-development of the vault. Sometimes hydrocephalus is present. The heart may be malformed. Such cases usually die at birth. (See T. Barlow, "Path. Trans.," Vol. xxxii. and xxxv.)

PERNICIOUS IDIOPATHIC ANÆMIA.

Fatal cases of anæmia occur in children in which careful post-mortem examination fails to find any other lesions than *fatty degeneration* of many parts (such as the heart, liver, kidneys, blood-vessels), and hæmorrhages into the retina and serous surfaces, skin and mucous membranes. The degree of anæmia is then so profound that both fatty meta-

morphosis and *blood extravasations* are regarded as its consequences. The cases are perfectly parallel to the pernicious anæmia of the adult.

The symptoms are breathlessness on movement, variable fever, vomiting, progressive decolorization, and asthenia without much wasting. I cannot agree with Dr. West in thinking that murmurs are rare in children's anæmia.

Other symptoms—as headache, giddiness, constipation, palpitation, flashes of light, restlessness, and apathy—are met with. Infants are said to differ from adults in having relatively less blood-disks and hæmoglobin (oligæmia), but this I question. The *treatment* is seldom successful. Though the case cannot be called pernicious unless it ends fatally, still I have seen a very remarkable degree of anæmia (20 per cent. of red blood disks and 20 per cent. of hæmoglobin) disappear under treatment, and yet there was no apparent cause for the disease. In what follows I indicate the treatment for severe anæmia, no matter what its cause or its termination.

Prevention of expenditure of energy.—Severe anæmia necessitates very careful treatment. Everything must be done to eke out the powers of the patient, to prevent unnecessary expenditure of force, and to improve the quality of the blood. We cannot trust to medicines. The whole of the surface of the body must be kept at a uniform degree of *warmth*, partly to prevent catarrhs and partly to lessen expenditure of force. This indication is fulfilled by keeping the child in bed, which also reduces the taxation on its respiratory, circulatory, and neuromuscular powers to a minimum. Even then there may be *restlessness* from nervous irritation. This is best combated by *opiates*, carefully given. Chlorodyne in five-minim doses, for a child six years old, repeated as few times as necessary, is the best preparation. If there be albuminuria, or if the opiates cause stupor, bromides

gr. v., or chloral gr. v., in syrup, may be prescribed. But the tendency of these agents to weaken the heart and lower the vitality and temperature must be remembered. The restlessness may sometimes be overcome by means of the *wet pack*. The child is wrapped from head to foot in a damp sheet, and then closely covered with many blankets; this is done for an hour, and may be repeated twice or thrice a day. It is said also to improve the condition of the blood when regularly used and combined with shampooing. Some recommend in addition the employment of *massage*, and in the successful case already referred to I used this measure. The rubbing was done once a day, and occupied fifteen minutes. The whole of the body was kneaded, but not roughly. I am inclined to believe that massage may be very useful in severe anæmia. The patient must have an *atmosphere* free from mechanical and chemical impurities. The *emanations* and excretions from such patients often smell offensively, but only partly from the constipation, which is a customary feature. If possible the child should be treated at the sea-coast; the situation should be high, the drainage perfect, and the air free from excessive humidity.

Stimulants—weak brandy and water, high-class champagne, good claret—are sometimes needed; they promote appetite and digestion, as well as renew strength. The quantity should be small, and given with the meals. Attention must be given to the *bowels*, which should be kept open once a day by simple remedies. I am of opinion that salines are best. Eno's Fruit Salts in teaspoonful doses, or fluid magnesia, are often efficient, and children take either readily. Iron will be of no use unless the bowels act regularly, and the iron appears to me to be better absorbed when salines are used as purgatives. The dose of the purgative should not be large, as purging reduces strength. *Thirst* is often a marked symptom, and small doses of cold filtered water may be

allowed pretty frequently. *Vomiting* is often a troublesome symptom in severe cases. The food should be given in small doses, and much experimentation may be required to find a food that will keep down. Weak veal broth, chicken tea, grape juice, orange juice, barley water, iced strippings, beef-tea—all cold—will often remain when any form of milk, even pancreatized, is rejected. Asses' milk, unboiled or boiled, has proved of service. Highly important is it to give fresh foods wherever possible. One white of egg in cinnamon water, ʒv., weak raw meat juice, fresh lemon or orange juice, are valuable. Some cases of anæmia may be traced to the child's having had foods from which the element of freshness has always been wanting. The *vomiting* may be controlled by minute doses of gray powder, gr. ¼, given every three hours; or arsenic in drop doses at similar intervals. In these doses mercury does not further diminish the amount of hæmoglobin, unless its use be continued for days together. Dover's powder in gr. i. doses may be given with the mercury, to increase a sedative effect.

Hæmatinics.—The best preparation of *iron* is the tincture of the perchloride in 5-minim doses four times a day in half-a-dram of glycerine freely diluted with water. The exsiccated sulphate of iron in 3-grain doses four times a day, or the simple vinum ferri ʒi. t.d.s., may be prescribed. Large doses of iron I am not in favour of. I prefer to give small doses frequently, so that the mucous membranes of the intestines and stomach are more constantly bathed with the mineral. The bowels must be effectively open, or the iron will do no good. Iron fails in some cases which arsenic, alone or with iron, will benefit.

Saccharated carbonate of iron, reduced iron, or dialysed iron should be prescribed when other preparations of iron irritate. It is not always the iron that irritates. Frequently the stomach is deranged by or with the disease. Other medicines

than iron may be given as gastric sedatives. Iron in its acid forms curiously sometimes cures the irritable state of the stomach. *Catarrhal* conditions are best relieved by alkaline preparations. Henoch strongly recommends *chalybeate waters*, and, if the child be strong enough to proceed to some of the spas, doubtless the change of air and scene will also effect some benefit. In children some years old change of scene is not an imaginary therapeutic agent. Mental impressions may produce great changes in a child's health, both in the production of disease and in the amelioration of the same.

When *arsenic* is employed, small doses ♏ii. of the liquor arsenicalis given four times a day with the meals is the best method. I have used phosphorus in gr. $\frac{1}{100}$ doses to children five years of age, but without any apparent advantage. (See Rickets for mode of administration.) In one case I tried alone 5-grain doses three times a day for a boy five years old of the *black oxide of manganese*, but without good results, though it seemed to allay flatulence.

Massage is most useful when patients are confined to bed; it must not be roughly done, for bruising readily occurs in these patients. But the child should be encouraged to take walking exercise or play in the open air if he be well enough; since tissue change is thereby promoted, and the supply of oxygen taken in is greater. In such cases both these factors are advantageous. Exercise and gymnastics should not be taken in an impure atmosphere, nor immediately after meals. If the child be in town his muscular exercise should be in open spaces where there is no dust, and where the ground is well drained. Muscular movements must not be carried to the fatigue point, or to the production of palpitation. Much perspiration indicates weakness or too violent exercise. Great care will be needed in such cases to prevent chill. The exercise may have to be dispensed with altogether. If the child has perspired freely he should not cool down out of

doors. Even in summer weather the sweat may wet the clothes and act as a cause of chill.

Cold sponging is a valuable tonic and alterative in anæmia. The water should not be too cold at first, but as the strength of the child improves a better reaction may be obtained by employing colder water. The *hypophosphites* of lime or soda, in one or two-grain doses t.d.s., have been used, but care should be taken not to upset digestion. Syrup of *lactophosphate* of lime ʒi. is prized by some. Pepsin gr. v. with the meals, or pancreatin two hours after meals with bicarbonate of soda and nux vomica, may be given with a view to improve *digestion*.

LIENOSIS—SPLENIC CACHEXIA.

Lienosis consists in simple hyperplasia of the spleen, anæmia, and an extraordinary cachectic tint of surface which is best likened to a faded box leaf—dull yellowish white.

The anæmia entails *œdema* of hands, feet, and eyelids, and a liability to *hæmorrhages* from the nose, into the skin and elsewhere. Henoch speaks of pseudoleukæmia in connection with this malady, but there is only a slight excess of leucocytes, and there need be no alteration in the proportions of white to red blood disks. There is no enlargement of adenoid tissues. Most cases occur under the age of two years.

I have seen many examples; nearly all were fatal, but they were out-patients. In the better classes there is hope of cure. Henoch mentions several cures.

Important is removal from *malarial influences* which are active in the causation in my belief, but this is not allowed by all. Slight rickets frequently coexists. A history of syphilis may be obtained, and sometimes actual evidence of past syphilis.

Treatment is of the utmost importance, but drugs are of subsidiary value. *Infrictions* into the skin over the spleen are needless. Injections into the spleen of carbolic acid 2

per cent., or arsenic 10 per cent. of Fowler's solution, must be utterly condemned.

The patient cannot have too much *fresh sea air*. Some authors prefer dry inland air for some cases. The usual precautions, however, are necessary. Cold and wet are to be avoided altogether. Impure atmosphere must be shunned outdoors, and prevented from polluting the nursery and sleeping apartments. Therefore, much furniture is to be excluded from the child's chambers. Everything in the rooms must be washable. Curtains and bed-hangings are to be banished. Children do go to the sea-coast in search of fresh air, but not unfrequently fail to obtain it, because they are kept indoors with the room assiduously sealed against its admission. Emanations from sewers and drains are also to be considered. When the child goes out it must be carefully wrapped up in its carriage, which should not be one of the closed variety. Its face ought to be freely exposed to the air. Care should be taken to keep the extremities warm, the hot-bottle being used if necessary. Woollen clothing should be used to cover the whole surface, and especially must the belly be protected. For these children are doubly children in their proneness to catarrh. High and dry sea-coast sites are to be chosen, and yet not too bracing. The hill outside old Hastings and the hills at Eastbourne are generally suitable.

Stimulants are of similar value here as in anæmia. Small doses of brandy or champagne or high-class claret should be prescribed with the meals.

The *diet* should be of the nutritious order, and of the anti-scorbutic description. There is nothing better than raw or under-done meat, fresh lemon, or orange, or grape juice, fresh milk, preferably of goat or ass, new-laid eggs, mashed mealy potato, one a day, pounded breast of chicken, mashed head of cauliflower, and other green vegetables if the bowels permit. It is essential that the digestive apparatus be in

good condition. Vomiting, diarrhœa, or constipation are to be relieved by ordinary remedies. Food and drink will have to be arranged in accordance with the gastro-intestinal state. The stools must be examined for undigested casein, fat, and starch, and rectifications of diet made accordingly.

Internal Remedies.—I use arsenic combined with iron.

℞ Fowler's solution, ♏ii.
Vin. Ferri, ʒii. t.d.s. after meals.

Henoch stands by quinine and iron. Other preparations of iron may be used as in anæmia. *Cod-liver oil* may be prescribed with the usual directions (see Scrofula). *Phosphorus*, in gr. $\frac{1}{120}$ doses, t.d.s., for a child two years old has been recommended. I have not used it here.

The disease called lienosis is not remediable by anti-syphilitic remedies, even though there be evidence in the history and in the nose root and elsewhere of past syphilis. It would seem as though the syphilis had exhausted itself in the production of a condition not of syphilitic nature, as we suppose happens when locomotor ataxy or other degeneration of the spinal cord results from syphilis.

Fluoride of ammonium, in five-minim doses, has been given to reduce the spleen. It must be administered cautiously. Fluoride of iron, as possessing hæmatinic properties, is thought to be better. Large doses of quinine, with sugar as powders, or in syrup of orange, tolu, glycerine, or, better, granules, are highly recommended. Most works remark on the tolerance by children of quinine. I cannot endorse the universal large dose treatment either of quinine, arsenic, iron, belladonna, or prussic acid. I prefer to begin with small doses, and increase gradually. This method has proved entirely satisfactory in my hands. Quinine may be given dissolved in water, or as a suppository by the rectum when vomiting precludes the oral method. It has also been infricted in the form of ointment into the groins and axillæ.

Infrictions.—In the early stages of this lienosis cachexia, mercury infricted, or oleate of mercury 5 per cent. painted over the spleen may be tried, but care should be had lest the anæmia be increased and the spleen remain enlarged. Many authors, however, recommend friction of the left hypochondriac surface with simple salves—neat's-foot oil or sweet oil, soap liniment—and the procedure is entirely unobjectionable.

In one case I have employed systematic *massage* for fifteen minutes twice daily. I instructed the parents how to do this. The case did not recover, but I think the treatment prolonged existence, and did not do harm. It seemed to allay restlessness and vomiting, and increased the appetite. I do not pretend to say altogether how it acts, but doubtless it promotes absorption of "fatigue" products and tissue change; it probably stimulates the living tissues also. Let me add that I merely wish to have massage extensively tried, and that I am not an advocate of any system, Mosengeilian or other. I truly believe that ordinary rubbing and kneading will do all that German or Dutch massage can.

Besides sea air, *tepid sea baths* are advisable. The water ought not to be used cold; if the child's skin glows after the dip into the bath it is a good sign. The reaction is what is desired. If the patient can respond to cold sea water douches they may be employed, but this should be a matter of experiment, and one of gradual trial. Such baths are not to replace the daily soap and water ablution of the skin, a process to be done in front of the fire in doubtful weather.

Leucocythæmia.—Leucocythæmia is a rare disease in childhood. Its features are progressive and continued increase in the number of white blood corpuscles, large spleen, progressive anæmia, and loss of strength; not much wasting, some irregular fever, often persistent at the close of the case, great tendency to hæmorrhage, and actual hæmorrhages from

various cavities, into the retina and into and under the skin. Œdema is the result of the anæmia. Effusions occur into serous cavities. Its chronic febrile course, with enlarged spleen and sometimes with enlarged lymphatic glands and overgrowth of lymphatic tissue in the internal organs (intestines, liver, kidneys, lungs), cannot be mistaken for any other disease, except tubercle, where, however, the wasting is more and the anæmia less, and the splenic enlargement not so great. The spleen may be enormously enlarged, reaching into the pelvis, in leukœmia. But a permanent marked increase of leucocytes does not occur in tubercle. *Malarial* and other emanations from the soil are given as causes. The medulla of the bones is rarely the seat of overgrowth of its soft tissues, and the bones may then be tender (myelogenic leucocythæmia).

Treatment.—The child's energy must be maintained in every possible way. The case is rarely seen till considerable disease is established. The *clothing* must be so arranged as to protect every part from cold and damp, and thus prevent excessive demands on the vitality. The patient should go out-of-doors in a carriage or perambulator when the weather is fine, every precaution being taken to keep him warm and free from damp and cold. *Muscular exercise* must be reduced to a minimum if the case is already advanced. *Absolute rest* is needed, so as not to tax the energies of the respiratory and circulatory organs when the anæmia is profound, and the total hæmoglobin greatly reduced in quantity. The food must be nutritious, and should consist largely of under-done or raw meat and raw meat juice. Orange juice and fresh lemon juice are also valuable. Fresh air is most necessary, and the ventilation of the patient's chambers should be rigidly attended to. Some sunlight is good. For other treatment, the section on anæmia may be consulted. The wet pack, as in fevers, has been used, on the idea that it not only reduces

the fever and soothes the nervous system, but also promotes nutrition and makes blood.

Arsenic is, perhaps, of as much use as any other drug. It may be prescribed in drop doses, gradually increased, three times a day, taken on top of the food. Iron wine may be given with it; it acts in the capacity of an alterative, promoting tissue change. *Cod-liver oil* in minute doses to begin with should be tried in the same way as in scrofula. *Quinine* exercises but little influence on the spleen or the disease generally, though it has been largely used. In any case it does not do harm, and may be prescribed in grain doses of the tannate or sulphate thrice a day. *Mineral acids*—of which nitromuriatic acid is the best—may be prescribed as a tonic, 5 minims in Inf. Gent. Co. ʒii., four times a day, an hour after meals, for a child 2 years old. *The infriction* of iodide of mercury ointment over the region of the spleen has been tried. Minute doses of mercury and chalk, gr. $\frac{1}{6}$, four times a day, have been given on the view that minute doses of this metal act as a hæmatinic. *Phosphorus*, in gr. $\frac{1}{100}$ doses thrice a day, has also been tried; and Dr. F. T. Roberts speaks highly of its use in adults (see Rickets). Galvanism likewise, the positive pole being put over the back and the negative moved about over the splenic region may be employed for ten minutes twice a day. Dr. Gowers asserts that it contracts the spleen, expels retained leucocytes, and stimulates the functional activity of the organ.

The *faradic* current has been used over the spleen. According to some, the white blood corpuscles are diminished in number after this treatment, which is done twice a day for fifteen minutes. Dr. Poore has noticed a temporary diminution in the size of the spleen from this treatment; he has observed an increase in the number of white blood cells immediately following the application.

Injections into spleen.—Arsenic, ergotine, iodine, and

salicylic acid have been injected into the enlarged spleen, but they should never be employed again. *Extirpation* of the spleen is said to have always been fatal. Diarrhœa, constipation, fever, œdema, hæmorrhages, and pain must be treated as they would be in any other case.

Lymphadenosis.—The difference between lymphadenosis and lymphosarcomatosis is one of degree. The duration of the former is longer than that of the latter. The enlarged glands and overgrowths of adenoid tissue, even in lymphadenosis, vary considerably in consistence and rate of growth. Sometimes the enlargements are soft and cellular, and at others hard and more fibrous. Whether leucocythæmia occurs or not, may partake of the nature of an accident. It would not be absurd to describe leucocythæmia and lymphadenosis together. Lymphadenosis is a chronic febrile disease, attended with enlargement of lymphatic glands and lymphatic tissues generally, and marked by anæmia, asthenia, and little wasting. Sometimes the adenoid hypertrophies occur mostly externally, and sometimes mostly in internal organs—spleen, intestines, mesentery, &c. There is but little tendency to suppuration or caseation in the glands. Its characters are much the same as in adults.

The *treatment* of it is the same as that for leucocythæmia. The general management of hygiene, diet, clothing, sleep, exercise may be carried out on the same lines as for scrofula. Treatment is also directly aimed at the large glands. They may be removed surgically if accessible. Dr. Gowers advises operation, provided the red blood disks are not less than 60 per cent. of the normal. A slight increase in the white blood corpuscles need not preclude surgery.

Infriction.—Ointments of iodine, lead, and iodide of potassium may be rubbed into the skin over the glands, with the object of causing absorption of the glandular overgrowth. Simple friction with sweet oil appears to be equally efficacious.

Counter-irritants.—Liniment of iodine and tinct. of iodine are also painted over them; these act partly as counter-irritants, and, being absorbed, the iodine may exercise some influence.

Fomentations, whether simple or of seaweed, are of little value unless the glandular enlargement be very rapid, when I suspect scrofula rather than lymphadenoma. Spirit lotions, and lotions of iodine and iodide of potassium, or chloride, or nitrate of ammonium, have all been employed as absorbents.

The injection of arsenic, iodine, eucalyptol, carbolic acid, and other agents into the large glands must be deprecated. The constant current of *electricity* has been recommended. I have used it without effect. The positive pole is placed at the back of the neck, and the negative moved about over the glandular enlargements of the axilla and neck; a weak current, of five to ten cells, Leclanché, may be used for ten minutes twice a day. I have thought that *wet compresses* to the glands of the neck has been followed by diminution in size; they were employed for two weeks together.

Internal remedies.—The internal administration of drugs is not very successful, but *arsenic* is the one which has seemed to me to prolong the course of a case more than any other. I do not give large doses, not more than three minims three times a day to a child three years old. Some employ much larger doses, both in these diseases and in chorea. Doubtless children tolerate them, but not always, and I am not aware of any advantage to be gained by the use of them.

Phosphorus, in gr. $\frac{1}{100}$ doses, is sometimes useful, but of course not permanently. See Rickets for its mode of administration.

Cod-liver oil is also valuable. Quinine iron, and syrup of iodide and syrup of the phosphates may be prescribed. (See Scrofula.) Iodide of potassium, in three-grain doses t.d.s., and liq. potassæ in ♏iii. t.d.s. doses for a child two years old, have been said to reduce the size of the glands.

Infantile scurvy—Acute rickets.—Infants who are fed on prepared foods, in which the element of *freshness* is wanting, are liable to scurvy, which presents some peculiarities in the infant. Such infants are usually rickety also because the foods, besides not being fresh, are indigestible. The scurvy shows itself as blood extravasations, which appear to have a special propensity for the periosteum of long bones, doubtless as a consequence of the more rapid growth of bone in infants. But the long bones may be the seat of hæmorrhage even in the adult scurvy.

Unlike the adult scurvy, the gums may be free from obvious sponginess and hæmorrhagic tendency. Dr. Barlow noticed slight points of hæmorrhage, however, into the soft papillæ of the enamel bed. The spongy, bleeding gums would seem to be more common when the teeth are present, which they may not be at the time of the development of scurvy. Scurvy mostly occurs before the age of 18 months, and delayed dentition is due to the associated rickets. Hæmorrhages may occur in most tissues—intermuscular septa and muscles, skin and subcutaneous tissues, mucous membranes, and serous cavities.

Rickets is not an essential part of the disease; there may be no bony signs of rickets during life. Careful inquiry elicits the information that about the onset of the hæmorrhages the food was always wanting in the element of freshness. In the cases collected by Dr. Barlow, the food was exclusively of the preserved kinds—Nestle's Neave's, Ridge's, Savory and Moore's. The chief symptoms are great tenderness and pain, with cachexia, in which there is marked anæmia, doubtless due partly to the hæmorrhages. The epiphyses of the bones may separate, then there is still more inability to move the limbs—a *pseudo-paralysis*, something like that seen in syphilitic bone disease in infants, which are, however, usually of a younger age than those suffering from infantile scurvy. Signs of syphilis, besides the pseudo-paralysis and bone swelling about the junction between the shaft and epiphysis, may be

present to help the diagnosis. The swelling of the limbs in infantile scurvy is usually wider spread along the shaft, and is greater in degree. The tenderness and brawniness of soft tissues is evidently not due to bony overgrowth, and so cannot be confounded with the diffuse periosteal ossifying growths sometimes seen in syphilis after the first year of life.

Infantile scurvy seems sometimes to mend of itself, but the scorbutic character of the malady is further testified by the rapid improvement that ensues on the administration of fresh foods.

Local treatment is of the greatest importance. If there be separation of the epiphysis the limb affected should be well supported by sand bags at the sides of the limb, or the application of light cardboard splints.

I have treated two cases by covering the thighs with lint, and allowing spirit evaporating lotions to be frequently dropped on. Dr. Barlow recommended cold wet compresses, well wrung out, at first during the tender stage; these I have used and seen used. When the swelling is disappearing, *shampooing* the limb gently and the *infriction* of neat's-foot oil are valuable modes of getting the last of the clot absorbed. This should be performed twice or thrice a day for ten or fifteen minutes, and preferably just before a meal, for the system will then be in its most absorptive mood.

General treatment.—But the local treatment is insignificant, compared with the simple ingestion by the patient of a little raw meat juice, barley water, and fresh goat's milk, or cow's milk, or ass's milk and some fresh lemon juice, or orange or grape juice. A diet list should be drawn up, prescribing a little food every two hours, and consisting of the above-mentioned articles.

Naturally the bowels and digestion must be looked to. If there be vomiting and marked anæmia with constipation, the rectum should be emptied by an enema of soap and water, and

half-a-dram of castor oil. Then iced raw meat juice with ten drops of brandy, or ass's milk (or fresh cow's milk and barley water or isinglass) with the brandy, will usually be kept down.

There may be no difficulty with the feeding. All that is then necessary is to give the fresh food. Potatoes mealy and mashed, smashed apples, turnips, cauliflower, pounded underdone meat or pounded fish, if the child be over a year old, may be given in small quantities. Lemon juice, fresh grape juice, and orange juice are simply invaluable.

The *anæmia* will have to be met by vinum ferri ʒi., and Fowler's solution ɱi., t.d.s., or some other iron preparation. Cod-liver oil in small doses, the stools being inspected to see that it is digested, is useful to promote a return to health, and the more so if rickets be present.

However strong the syphilitic history may be, *mercury* should not be given till the anti-scorbutic system has failed. It is very doubtful indeed whether syphilis can lead to such periosteal extravasations.

In one case where the scapulæ, tibiæ, femora, and ribs were involved, the *wet pack* was used, as in fevers, and with manifest relief to the child's distress.

Fever is frequently coexistent in these cases, and is perhaps due to the nervous excitement produced by hæmorrhages into such tense structures as the periosteum. Simple hæmorrhages ought to lower the temperature of the body not to raise it. No evidence of inflammation has been found when the sanguiferous periosteum has been examined after death.

The necessity for *fresh air*, *warm clothing*, *sunlight*, and *cutaneous ablution* is urgent. Draughts and chills and wet are to be avoided. Even if the legs be broken by separation of the epiphysis, the child should go out of doors in a perambulator and lying down full stretch, with its face exposed to

the air, but not to a strong sun. There is seldom any call for the use of *opiates* or *sedatives*. A drop of laudanum may be given occasionally if the infant appear in great distress. This is better than chloral or bromide.

Purpura—Morbus maculosus (Werlhofii).—Purpura owns, like anæmia and other symptoms, a thousand different causes. Purpura morbillosa, scarlatinosa, &c., are not commendable terms, as any malignant acute specific may be attended with symptomatic purpura.

Purpura rheumatica may possibly occur in genuine rheumatism, but frequently the rheumatism is false—mere pains and tenderness with arthritic swellings having no migratory tendency, and probably in many cases anatomically due to blood extravasation.

Here we treat of the genuine idiopathic purpura which may be slight and cutaneous (p. simplex), or severe and universal (p. hæmorrhagica). The disease is not scurvy, for it in no way depends on want of fresh meat and vegetables. It is not hæmophily, for it does not last for ever, being a mere episode in, or termination of the child's existence. It is not a malignant acute specific fever, for the sudden onset with high fever is absent.

Usually vague pains and a few symptoms of indeterminable character are the warnings of the disease. But hæmorrhages may be its first declaration. The bleedings may occur in any tissue, even into the firm testes, where I have thrice seen them in boys. Micro-organisms have been found in the thrombi of vessels at the seat of hæmorrhage (Watson Cheyne "Path. Trans."), but not in the circulating fluid. Death may ensue from uncontrollable bleedings and their consequences—anæmia, fatty degenerations or more acute syncope.

Treatment.—The patients should be confined to bed. All movements *seem* to increase hæmorrhage, and any accidents cause *bruising*, sometimes of extensive and alarming character.

Gravitation seems to be operative in the induction of the ecchymoses and petechiæ in the lower extremities—another reason for the recumbent posture.

Though freshness of food may have had nothing to do with the causation, it is advisable to prescribe foods having this important quality (see Scurvy). Any insufficiency of food may have had some share in the etiology. The *dietary* should be nutritious and adequate, containing fresh animal and vegetable proteids, fats and carbohydrates—eggs, meat, cauliflower, well-done potato, little fruit, &c., but there may be vomiting when small doses of cold fluids alone should be given.

The hygienic conditions of fresh air and clean clothing, with customary ablutions, should ever be remembered.

Purgatives.—When the disease attacks robust children with plenty of blood there is nothing to compare with the treatment by *saline purgatives*. The form that I prescribe is sulphate of soda and sulphate of magnesia, of each half-a-dram, dissolved in hot water, and an ounce of compound infusion of senna (U.S.P.), for a child four years old, taken on an empty stomach. This may be given twice or thrice a day for two days, but not longer.

Supporting plan.—But such purgation is useless when the child was previously cachectic. Here a more supporting plan is indicated. Never hesitate to order alcohol—brandy in dram doses four or five times a day in milk or other vehicle. Stimulants may be needed, no matter how the disease began; they are valuable in the same manner as they are in anæmia. They do not increase the hæmorrhages as might be thought.

The tincture of the perchloride of *iron* is that usually prescribed, and in full doses; partly as a hæmatinic, partly as an astringent. Ten to fifteen drops may be given in glycerine ʒi. to Aq. ℥ss., for a boy four years old, repeated three or four times a day. *Arsenic* may be combined with it.

℞ Liq. Arsen. Hydrochl., ♏iii.
Tinct. Ferri. Perchl., ♏x.
Glyc., ʒi.
Aq., ʒss.

Some practitioners use arsenic alone. I have not done so in purpura.

Turpentine I have frequently seen tried in severe cases. It should be given in large doses; half-a-dram in a gelatine capsule disguises it best. It is very nauseating. The compound almond mixture, honey, syrup, and glycerine, hide its taste somewhat. Dr. Gee is greatly in favour of the employment of large doses of turpentine in desperate cases. It may be given per rectum with mucilage of tragacanth ʒi. to ʒss. Some practitioners give five or ten-minim doses of turpentine. Hæmaturia would contra-indicate large doses of turpentine according to some physicians. Tincture of *larch bark*—twenty minims frequently repeated—is another remedy of which I have almost no experience.

Liq. ext. of *ergot* in ♏x. doses, or in larger doses less frequently, has been tried. I saw it used in two fatal cases.

Quinine sulphate, gr. i., dil. sulph. acid gr. iii., and tinct. ferri perchl. ♏x., glycerine ʒi., Aq. ʒss., is a favourite prescription with some physicians.

Gallic acid, gr. x., t.d.s., is used for purpura, especially when complicated by hæmaturia.

Tannic acid may be prescribed in its stead. Similar doses of dried *alumen* has given success in some hands. These doses are suitable for children about five years old. I have rarely seen them all tried but without apparent good result.

Acetate of lead gr. ii., and opium powder gr. $\frac{1}{6}$, was prescribed three times in one successful case in a boy six years old. It is difficult to say whether the lead did any good. A little *opium* is of service when there is great *restlessness* and tossing about, as happens frequently in fatal cases.

Convulsions may usher in hemiplegia from bleeding into the motor region of the brain.

Local applications.—Where the hæmorrhage is accessible local applications may be made. Ice is most valuable, also hot water (105° F). Pressure or compression by means of conical compresses are certain means of arresting the bleeding if they can be applied. A multitude of styptics and astringents are recommended for causing coagulation and constringing vessels: perchloride of iron, sulphate of iron, dried alum placed on the bleeding surface, are some of the best.

Epistaxis may be treated by iced water injections. Dr. Eustace Smith advises spraying with a solution composed of two drams of strong perchloride to two ounces of water, first washing the nasal cavities out with iced or cold water.

He uses also powerful purges, marked anæmia notwithstanding, provided the case had not supervened on cachexia or was of the acute kind: two drams of oil of turpentine and two of castor oil made into an emulsion with mucilage of tragacanth, and flavoured with syrup of lemons and peppermint water. If the liver be swollen from hyperæmia the purging is all the more indicated.

The breath is often very offensive, and the mouth foul; the teeth and mucous membrane of mouth and fauces should be kept sweet and clean by syringing and moppings (soft rag or lint) with cold antiseptic lotions or hot water.

Hæmophilia.—Bleeders usually inherit the disease from their mothers, who are commonly free from the diathesis. The term hæmophilia neonatorum is perhaps not strictly correct, for usually the true hæmophily is not manifested till after some months have passed by.

Hæmorrhages are liable to occur from the mucous membranes and into the skin without any obvious cause, or as the result of a very slight exciting cause. No constant

changes have been found in the blood or vessels, and it is possible that the disease may depend on derangement of some central nervous centres. It is well known that experimental irritation of the pons Varolii may cause widespread blood extravasations. It is essential that the diathesis be persistent, otherwise it would not be distinguishable from some cases of purpura. Hæmorrhages occur into the joints, and the cartilages may become eroded. It is doubtful whether all the joint swellings are of hæmorrhagic nature.

As bearing on the question whether the diathesis is congenital, I may say that I have made an autopsy on a boy aged 5, who died of diphtheria and pneumonia. He was an idiot. The right half of the brain and some part of the left was atrophied as the result of hæmorrhage into its substance. The nose frequently bled spontaneously. Several of his brothers were bleeders, and one had died of the bleeding. There was a marked history on the mother's side. It is only right to add that the cerebral hæmorrhage probably occurred at birth, and most likely as the result of the instrumental delivery.

The *teeth* should never be extracted in bleeders; they should be allowed to be shed; but still the care of the dentist to keep them, and see that they grow regularly and in their right places, is desirable.

Fresh food is necessary; *salty* and *stale* foods ought to be avoided. The principle is to prevent any scorbutic tendency. For hæmorrhage is liable to occur from the gums; scurvy would increase this propensity. The gums should be kept hardened by the careful and regular use of the tooth brush and some astringent lotion; chlorate of potash gr. x to ʒi. and warm water in equal parts, or alum, tannin, or rhatany lotions may be employed. These are more necessary when any sponginess of gums or looseness of teeth exists.

The proneness to bleed is increased when the general

health is any way disturbed, though curiously not when any definite illness exists—such as pneumonia or measles or hooping cough. The *neuro-muscular* apparatus may be kept in good condition by outdoor *exercise*, but the *violent games*, including cricket, hockey, and football, are better prohibited. Fresh air, free from mechanical (carbon, &c.), chemical (overcrowding), and physical (from excess of moisture) impurities, is valuable for respiratory purposes, and for keeping the respiratory organs in sound condition. Avoidance of cold and damp climates wards off constitutional diseases. I have elsewhere stated my belief that excessive humidity is a factor in the causation of lymphatic overgrowths of any kind. *Exercise* also promotes the action of the bowels and prevents portal congestion. *Constipation* is to be specially avoided. The best purgative is mercury and a black draught—calomel gr. iii. for a boy 7 years old over night, followed by ʒss. each of sulphate of soda and sulphate of magnesia, taken hot before breakfast with an ounce or half-an-ounce of the compound infusion of senna of the U.S.P. If the constipation continue after this, and in spite of attention to the dietary, other measures will be necessary (see Constipation).

The *renal functions* ought also to be acting efficiently. This is promoted and the action of the bowels also by the imbibition of sufficient watery fluids every day. There is reason for believing that any overloading of the blood with waste products increases the propensity to bleeding. This overloading may occur from insufficient fresh air, inadequate hepatic and renal excretion, and of course intestinal accumulation.

Epistaxis frequently requires treatment. If possible, the nasal douche with ice-cold water should be used, or syringing the iced water into the nostrils. I have heard of very hot water being tried successfully also. It may be

necessary to plug both anterior and posterior nares with Belloc's sound or an equivalent. Some recommend the injection of astringents, such as perchloride of iron ʒi. of the liq. fortior. to ʒi. of water. Wherever possible nothing is so efficient and so little liable to be followed by sloughing and ulceration as simple compression. This is the method for arresting hæmorrhage after tooth extraction. The extraction may give the first sign of the existence of the diathesis.

Persistent and continuous bleeding is best averted by a powerful *purgative*, the patient being kept in the horizontal position. Nature staunches the more acute hæmorrhages by an approach to syncope.

Hæmorrhage from the rectum may be controlled by a smooth cylinder of ice inserted within the sphincter. Injections of iron and very hot water (105° F.) are also lauded.

Liquid extract of ergot in frequent ɱx. doses has been recommended for urgent bleeding. The hæmorrhage is generally from capillary vessels, and ergotine contracts the arterioles; though whether the raised blood pressure would promote hæmorrhage is not answered.

Turpentine, rectified spirits of, in half-dram doses, have been employed. Hæmatemesis has ceased under its administration in my hands, but it frequently fails, not only in "bleeders," but in other cases of hæmorrhage.

Joints.—Large extravasations of blood under the skin and into the joint may be treated by cold wet compresses under oil-silk frequently renewed and associated with uniform careful pressure by bandaging. Blisters and iodine have been tried to reduce the arthritic swellings. I have not used them nor seen them used. The actual cautery should not be employed.

After much bleeding or extravasation of blood profound anæmia with great diminution of the red blood disks is seen.

Here rest in bed, careful nursing and feeding are called for (see also remedies for severe anæmia).

CHAPTER V.

RHEUMATISM.

THERE are great differences between children's rheumatism and that of adults. But the migratory tendency of the arthritic manifestations, the tendency to relapse, and the widespread lesions are some features in common. I believe there is a type of children's rheumatism. A typical case of rheumatism in a child may be pictured as one that presents in the course of a single attack of the malady the following phenomena: Erythemata, subcutaneous nodules, joint affection, endocarditis, and chorea. All these phenomena or links of the rheumatic chain have I seen in the course of a single attack of rheumatism in a child. The children's rheumatism is characterized by the frequency of erythemata, nodules, endocarditis, and chorea, and by the slightness of arthritis, pain, pyrexia, and sweating. Sometimes the swelling of the joint appears to be outside rather than inside the joint. Indeed, there is abundant reason for thinking that tenosynovitis with effusion occurring in the neighbourhood of a joint has been mistaken for actual arthritis.

The slightness of the pain and tenderness rather favours the view that the effusion is not great within the joint. The swellings in children's rheumatism are well seen as cushion-like elevations about the backs of the wrists and the dorsa of the ankles. The painless and inconspicuous subcutaneous nodules, composed of delicate fibrous tissue, are situated about the elbows, patellæ, and malleoli for the most part; but they may be found on the vertebral spines, the spine of the scapula,

the line of the clavicle, the crest of the ilium, about the extensor tendons of hands and feet, the pinna of the ear, the temporal ridge, the forehead, and the superior curved line of the occiput. They are usually painless, and not noticed by the patient or parents. They may be few in number, isolated, or grouped in large numbers. Their size varies from a pin's head to an almond. The skin is movable over them, and they are not firmly attached to the fibrous structures beneath. They have a remarkable tendency to disappear, but sometimes they persist for weeks and months together. So they may come out in successive crops. They may last only three and four days. I have seen these nodules about a wrist joint in which there was well-marked effusion. Generally, however, the joint effusion is absent where these nodules exist. I have no wish to deny that acute rheumatic fever, such as is seen in the young adult, may not have its exact counterpart in a child, though this in my experience is rare.

Erythema marginatum and papulatum are unquestionably of rheumatic origin, and of very frequent occurrence in children's rheumatism.

Erythema nodosum is doubtless allied to rheumatism, but heart complication is very rare, if it occurs at all, in immediate connection with it.

Urticaria and purpura are sometimes of rheumatic origin. Pericarditis is not uncommon in children's rheumatism. Serous pleurisy is at times of distinctly rheumatic source. Stiff neck and tonsillitis may also be due to rheumatism. Unquestionably chorea is sometimes, but not always, a rheumatic symptom. It is of prime importance to remember that any of the rheumatic phenomena may occur alone, and that any combination of them may be met with. Moreover, they may alternate with one another, and rarely the whole of them may co-exist. Thus we can hardly call any of them

sequelæ without allowing also that they may be complications of the rheumatic attack. Sometimes the attack is long drawn and straggling, being constructed of a curious succession and combination of symptoms. If one of the symptoms comes first we must be on the *qui vive* for others. Hence it would not be ridiculous for a doctor to keep a child in bed for urticaria or erythema, even though there were no other sign of illness; for I hold that the frequent endocarditis and pericarditis of children may be partly at least due to the mechanical irritation resulting from the want of rest. In adult rheumatism the joint trouble leads to immobility, and the stress on the heart must therefore be less.

The rheumatism that sometimes follows and sometimes accompanies scarlet fever may be true rheumatism, but, unlike true rheumatism, suppuration of serous effusions is frequent.

The basis of a valvular vegetation in endocarditis may be described as a nodule, and Dr. Barlow regards a subcutaneous nodule in rheumatism as homologous with the valvular nodule. Rheumatism is manifested anatomically in discrete lesions, often grouped together. An erythema may be but one minute spot, but usually many red spots develop in close contiguity. So it is with the valvular beadings and the subcutaneous nodules. Dr. Barlow has described a nodular form of rheumatic pericarditis, and I have seen several fibrous nodules on the wall of the heart in a case of rheumatic pericardial adhesions.

I have said the pyrexia of rheumatism is slight; the temperature seldom goes beyond 100°. Occasionally, however, a high fever is registered, but hyperpyrexia is very rare. And so are the cerebral phenomena — headache (see chapter on Headache), delirium, sleeplessness, and unrest—uncommon in children's rheumatism. The heart is almost invariably the seat of a murmur during some part of the

rheumatic career. These murmurs frequently are heard a few days after the illness begins. They often disappear altogether. Sometimes the anæmia has caused them. But at others I believe that the valvular nodules (endocarditis) have subsided, and the murmur caused by them also. It is an error to say that the right side of the heart is not affected in children. Post-mortem examinations not unfrequently reveal beadings on the tricuspid valve. The pericardium and endocardium may inflame without any indications of rheumatism in the limbs. This fact is included in the statement made on p. 120.

The *severity* of children's rheumatism may be measured by the number of nodules. It does not follow that all the rheumatism will not disappear when it is of severe degree. Much of children's rheumatism is smouldering and lingering in its course, and then, I think, the persistence of the nodules is, to a certain extent, a warning and a guide of this. But the rheumatic cause may pass away and still the nodules remain and the heart mischief increase. Here must we suppose that some other irritant than rheumatism is keeping up the nodules?

The **diagnosis** of rheumatism in children may often be made when there is no true rheumatism. Infantile palsy may be called rheumatism owing to the pains and tenderness and fever which may announce its onset; even swelling about the ankle may occur and simulate rheumatism. The rapid development of paralysis with loss of reflex action, however, soon clears the case. The Germans have described as rheumatic a slight swelling about the back of the wrist and front of the ankle that may attend the onset of painful tonic spasm of the hands and feet (tetany). The immobility (due to pain) (pseudo-paralysis) of limbs, often symmetrical, that is seen in some cases of congenital syphilis about the elbows nd wrists, or knees and ankles, may be mistaken for rheu-

matism; but the swelling is in and around the end of the shaft of the bone, and not strictly at the joint. Rickets may be associated with tenderness and swelling of the wrists, but this could hardly be mistaken, nor yet could the scurvy rickets, with its hæmorrhage into the periosteum of the long bones, although this may involve one limb after the other. Hæmophily is attended at times with effusions into joints; these are sometimes hæmorrhages. An insidious acute joint inflammation of a large joint (hip, knee, ankle), that rapidly suppurates, and when evacuated as rapidly heals, is seen in young infants, and this without much fever. The child may die suddenly, however. Umbilical phlebitis suppurativa may be associated therewith. Gout may in a child cause a periarthritic effusion of serous nature, and with a temperature of 102° some pains and slight sweating. All these conditions have I seen with the exception of the last mentioned, but it is only just for me to add that the collocation of them in connection with rheumatism we owe to Dr. T. Barlow.

The **treatment** of rheumatism consists in keeping the child in bed (*rest*), supplying it with copious bland fluids and administering *alkalies* and *salicylates* (*removal of poison*). The *joints* may be wrapped up in cotton wool (*relief of pain*). The *skin* should be sponged daily, and perspiration, which we have seen to be slight (often nothing more than moisture of palms and soles), promoted. Salicylates do not do much good unless there is pain and joint effusion. This is my conclusion. And I prefer the use of alkalies.

℞ Citrate of Potash, gr. vi.
Syr. Aurantii ʒss.
Aq., ℥ss.

Four times a day to a child five years old.

The urine should be kept alkaline by means of the medicine. If a joint be specially painful, a hot wet compress

frequently changed is good treatment, and the salicylates should be employed.

℞ Potas., Carb., gr. v.
Salicylate of Soda, gr. v.
Syr. Aurantii, ʒss.
Aq. ℥ss.

Every three hours for a child five years old. It is seldom necessary to continue this treatment more than 24 hours, and the alkali should be combined with it.

The *diet* should be purely liquid whilst the fever lasts—milk and barley water, beef tea and mutton broth, thickened with Savory and Moore's food. In *convalescence* fish may be allowed. Meat and eggs are interdicted as increasing the rheumatic tendency. The bed must be kept for a week or ten days after the disappearance of all active symptoms. *Relapse* and *recurrence* must ever be in the mind of the practitioner when treating rheumatism. The value of cold douches in averting this tendency may be remembered. The best *tonic* for a convalescent from rheumatism is quinine and iron, the anæmia being often a marked legacy.

℞ Quinine Sulph., gr. ½.
Tinct. Ferri Perchl., ♏iii.
Glyc., ♏xx.
Aq. ʒii. t.d.s.

For a child five years old.

The *bowels* ought to act once a day; mild laxatives, not powerful purgatives, are used—fluid magnesia, or Eno's, or Carlsbad.

The **stiff-neck** of rheumatism should be treated in bed, for a day or two at least. Likewise the *tonsillitis*. And watch for other rheumatic phenomena, and specially listen to the heart every day, or twice a day. The *debility* of chronic rheumatism is best treated by careful hygiene—air, diet,

clothing, exercise, and the use of ʒss. of iodide of iron syrup twice or thrice a day.

Tonsillitis.—Alkalies, bicarbonate of soda, appear to be very valuable. It is sprayed—gr. x. to ʒi.—on to the throat at frequent intervals during the day. It is applied externally as compresses, and given internally in five-grain doses three times a day, with inf. of gentian. A daily full, but not vigorous, action of the bowels may be secured with saline purgatives.

Pericarditis and *endocarditis*, see special sections. Repeated hot fomentations or spongiopiline, changed frequently, not leeches; poultices and jacket of cotton wool are used as local applications.

Prevention of complications is best effected by absolute rest in the recumbent posture, to relieve the heart as much as possible, and by the maintenance of a uniform and even temperature all over the surface, so as to avert a chill. Some advise keeping the child between blankets, but this is hardly necessary, and would involve the frequent change of blankets from induced sweating.

Prophylactic and hygienic treatment.—Rheumatic children should be *clothed* in flannel or woollen under-clothing. Cold and damp must be avoided. Rheumatic children are generally of *neurotic* type, often possessed of abundant energy, but this is prone to escape too easily. At times they resist their enemy stoutly, and at others fall an easy prey to fatigue, cold, or damp. A long day in the country for a Sunday School congregation, as Dr. Barlow truly observes, will often pick out the rheumatic children in the direction of swollen ankles and knees.

Further treatment of Rheumatism.—*Applications to joints.*—The cotton wool should be bandaged firmly and neatly on the joint. Compresses covered with oil silk are changed every two hours; they are retained by light

bandages. Blisters should not be used. I have seen minute blisterings used over rheumatic nodules. It is difficult to say whether they have any effect on these structures, whose duration is so variable. I have never seen the case that wanted a leech. Meigs and Pepper advise bathing painful joints with sedative liniment of sweet oil (℥i), chloroform (℥i.), tinct. opii (℥i.); (the quantities of the ingredients are mine). The joint is confined in *bats* of wool and oil silk, with a bandage to exclude the external air. In chronic cases care should be taken to prevent deformities of joints by correcting bad postures, &c.

Sweating seldom calls for other treatment than careful cleansing of cutaneous surface with tepid water, and scrupulous cleanliness of the child's clothes and bed linen.

Antipyretics.—Quinine is given in five-grain repeated doses. But tepid sponging, the wet pack, or, as can but rarely be required, the cold bath (see Fevers), are better employed. Antipyrin is sometimes given in acute rheumatism in children. It can be seldom required, for high fever is rare. One boy 12 years old took 90 grains in a single day without inconvenience (Neumann). But its use needs caution.

Diet and stimulants.—Stimulants are not to be used unless there be complications, or unless acute dilatation of myocardium set in. Brandy, whisky, or gin may be given in half-dram doses, repeated as often as the condition of the myocardium may suggest. (See Heart Disease).

Tonics and hæmatinics.—Quinine and iron are given in a variety of ways. The tincture of the acetate of iron ♏ xv., t.d.s., for a child of five, is valuable in the subacute varieties, for it acts on skin and kidneys, promoting elimination of materies morbi. Anæmia is a frequent and maybe an intense indication for treatment. Fresh warm air is most necessary.

Opium is very useful when pain is bad. Dover's powder

gr. iv., or chlorodyne ♏iv., for child of seven. For severe dyspnœa and failing heart there is nothing but free stimulation and opium, with counter-irritation by guarded mustard applications.

Specific and curative agents.—*Salicin* (gr. v.), *Salicylate of soda* (gr. x.), t.d.s., given in syrup of orange, child ten years old. Some combine it with a diaphoretic—liquor ammoniæ acetatis ʒss. The salicylates are thus prescribed till fever and pain subside. When these phenomena are present they disappear in three or four days under the salicin treatment. They have not much influence in my experience over the complications (heart and other) of rheumatism, and are far less valuable in the atypical forms of rheumatism which are so common, not only in children, but in adults.

Quinine and *arsenic* have also been ascribed a specific action.

Salicylate of lithia is prescribed in the same doses as the soda salt. *Acetates* of ammonia and potash are valuable diuretics and diaphoretics to eliminate poison.

Iodide of potassium is most suitable for atypical and chronic varieties of rheumatism. The isolated attacks of *rheumatic torticollis* and *tonsillitis* are also treated by specific substances.

Chronic rheumatic arthritis, or rheumatic gout.—This disease may be seen in children. I have seen but one case, in a girl ten years old; it followed an attack of acute rheumatism. It affected both feet and both hands; resembled the multiple joint affection of middle-aged women rather than the arthritis sicca of the old. The heart was not affected. The treatment adopted is the same as for the adult—Turkish baths or hot-air baths, iodide of potassium and quinine, with or without iron.

℞ Potassii iodidi, gr. iii.
Spt. Am. Arom., ♏x.
Aq. Chlorof., ʒii. t.d.s.

Great care must be taken in the avoidance of cold, damp and over-exertion. Cleanliness of the skin, fresh air, suitable clothing, and exercise are important. The diet should be liberal, though nothing but *indigestible articles* need be avoided. Beer and wine are not allowed. The pains may be relieved by the introduction of ηx. of Tinct. Acteæ Racem. into the iodide mixture. At least, in my case this seemed to lessen the pains. I tried it because I have found it useful in adults. Too much importance cannot be attached to the value of exercise in all patients prone to rheumatism. The inspirations and expirations are rendered more efficient, the skin and kidneys and liver act better, and are better supplied with blood, so that excretion of fatigue products and metabolism of the various substances (proteids and fats, and carbohydrates) is rendered more efficient. Overwork, especially of the brain, should be prohibited.

Ague.—Ague is so rare a disease in children in this country that I shall be brief in its description. When it occurs in children under the age of four years its symptoms are much less marked than at older ages. The initial chill is frequently slight, hardly ever a rigor; may be a convulsion. Sometimes there is mere drowsiness or more marked stupor. The sweating stage is also ill-defined. The hot stage usually lasts six or eight hours. It is well marked, and attended with great increase in the urinary discharge of urea and chloride of sodium and diminution of phosphates. The crisis is not a marked feature. The intervals between paroxysms are often attended with malaise, headache, drowsiness, or unwonted cheerfulness.

An enlarged spleen and anæmia may result from repeated attacks. Malarial cachexia may be observed.

The diagnosis may be difficult, owing to the indefiniteness of the attacks. Scarlatiniform rashes have been noticed in the febrile period.

A *large tender liver and spleen*, with sallow complexion, are contra-indications for quinine. A few doses of gray powder and saline purge (Eno's or Carlsbad, or sulphate of soda) should be ordered. When the tongue becomes clean, and the visceral enlargements have subsided, then is the time for quinine.

The *treatment* of an attack will be that of ordinary fever. The wet pack may be used if necessary. The food should be liquid, and bland, and abundant. Sweetened and flavoured, thin barley-water does well. Hot-air baths may relieve the hot skin. Quinine should be given in a full dose, gr. v., for a child of five, and repeated if required. It may be floated on the surface of milk, swallowed in gelatin capsule, or even put into the rectum in a suppository; or it may be disguised in glycerine and milk. Tannate of quinine may be used in gr. ½ doses under the skin. The solution and syringe should be warmed before being used.

Liq. Arsenic ♏ii. is valuable in the indefinite malarial symptoms. It may be given with steel wine (ʒii.), t.d.s., or alone with syrup of orange or lemon, or glycerine. It may be taken with syrup of lactophosphate of lime and iron.

CHAPTER VI.

GANGRENE.

THERE is no difference between gangrene in children and adults. If gangrene occur in Raynaud's disease, the parts should be kept warm, and the slough allowed to separate at the line of demarcation. Sometimes the gangrene spreads a little beyond the bounds of its first limits. It is usually a dry gangrene. Good nourishing food, meats, eggs, and wine should be given. Sometimes Raynaud's disease is very severe (see a case by R. Southey, "Clin. Soc. Trans.," Vol. xvi.).

Gangrene is apt to occur after scarlatina, variola, varicella, enteric fever, and especially measles. Sometimes embolism is a cause of it. Gangrene of the vulva has been associated with hæmaturia and embolism of the cerebral arteries. Gangrene of the vulva is fairly common. Male infants may suffer from gangrene of the scrotum. The symptoms, pathology, and treatment are the same as in adults. If the gangrene be of the dry kind the hot application should also be dry: bags of sand or bran. Cold must be avoided, and the diseased parts kept sweet; powdered iodoform blown on with Mayer and Meltzer's insufflator is very useful. The parts may be washed with chlorine water. Hot fomentations of boracic lint or poultices are required to stimulate the separation of sloughs. Sometimes the sloughing action may be arrested by the application of strong nitric acid over the whole extent of the necrosed part. Plenty of nourishment, in accordance with the child's powers of digestion, should be given. Meat, eggs, malted foods,

beef-tea, and wine should be ordered. Tonics of quinine and iron, or of sal volatile and cinchona, may be given also.

℞ Quinæ Sulph., gr. ½.
Tinct. Ferri. Perchl., ♏iii.
Glyc., ♏xx.
Aq., ʒii. t.d.s.

℞ Spt. Ammon. Arom., ♏xv.
Liq. Ext. Cinch., ♏iii.
Inf. Cinch., ad. ʒii. t.d.s.

For a child five years old.

Some advise the employment of large doses of quinine, gr. ii., three times a day for a child three years old. Opium is very valuable for relieving pain and promoting sleep. It must be given cautiously in drop doses of chlorodyne every half-hour, for the kidneys are likely to be inefficient and the urine albuminous in these diseases.

Gangrene of the lung cannot be diagnosed with certainty. It may complicate gangrene of the gums, pharynx or gullet, and the general causation of the gangrene is the same as for gangrene of the vulva and other parts. The treatment will consist in the supply of nourishment and stimulants, care being taken that enough and no more is introduced. The vitality is not maintained if the digestive system be overloaded. The amount of air passing through the sick chamber should be at least twice as great for any other disease. The horrible fœtor of the air necessitates this both for the child's own sake and for that of his nurse. The stench must be overcome by the free use of antiseptics about the room. The furniture should be of the most scanty description, perfectly smooth and washable. A chip box with crystals of iodine therein, and basins of Condy's fluid, will do something to relieve the room of the odour of gangrene. The carbolic spray may be allowed to play into the room to keep down

the stench. Besides the keeping sweet of the apartment, topical applications should be made in the form of inhalations of turpentine and terebene, carbolic acid, (each ʒii. to Oi. of boiling water), or any of those apparatus used in chronic bronchitis may be employed. These inhalations should be frequently repeated, without, however, fatiguing the child. Then not only is the fœtor attacked at its escape from the lungs and when in the room, but antiseptics are given internally—with but little effect I think. Salicylate and benzoate of soda, in five-grain doses every four hours, are perhaps the best; or the sulpho-carbolate of soda may be given in five-grain doses three times a day; glycerine of carbolic acid or creasote in two-minim doses three times a day. All these for a child five years old.

Tonics as well as stimulants are given to support strength and reduce temperature. There is a low temperature, however, at times. The best preparation is dram doses of the tinctura quinæ ammoniata as frequently repeated as necessary, for a child five years old, and given in water. The constipation is best relieved by castor oil, and the diarrhœa also, with, if necessary, small doses of opiates, provided there be no contra indication in the form of difficult respiration and feeble cough or great engorgement of the venous system.

Cancrum oris.—This is a form of gangrenous disease the pathology of which is not yet understood. It is very likely to occur in debilitated children after measles, and especially amongst the poor who live in unhygienic surroundings with vitiated atmosphere and unsuitable food. It may be associated with gangrene of the vulva, scrotum, or lungs. The chief symptoms are those of excessive *asthenia* with *gangrenous* odour of breath, salivation, and difficulty of eating and swallowing. There appears to be singularly little suffering, perhaps from the *apathy* of the child. The ulceration commences as a whitish or greyish area in the mucous mem-

brane of the cheek, which is indurated at this spot. The induration and sloughing spread with varying rapidity, and may lead to perforation of the cheek with necrosis of jaw. As there is but little pain, so there is but little fever, and perhaps from identical causes—the poison depressing the algogenic and thermogenic centres.

The child must not only be prevented from breathing septic atmosphere. He must also be prevented from swallowing the excretions from the slough. Minute quantities, not volatile, may find their way direct into the respiratory passages. Posture will do something to avert these accidents. The child should be kept in the prone position on its belly, with the bad side dependent and the head over a bolster.

Tracheotomy has been performed with the object above-mentioned. It was not successful, but the idea is a good one. It is done for the same reason as in operations on the tongue and palate.

The gangrene sometimes does not involve the cheek, but the gum or the region between the two. The usual termination is led up to by progressive increase in anæmia and asthenia, increasing drowsiness, diarrhœa, and frequently œdema. The appetite may survive in a remarkable fashion. *Septicæmia* or *pyæmia*, with abscesses, may supervene, or lung consolidations of lobar or lobular kind. As a rule the case lasts a week or two weeks. A fatal termination does not always occur. The induration and mode of spread, and the circumstances under which the disease arises, preclude any difficulty in diagnosis. The chief weapons at our disposal in its treatment are the usual hygienic ones. The child must be brought out of darkness into light; from poverty to wealth, or its equivalent; from filth and filthy air to cleanliness and purity of atmosphere; from bad and insufficient feeding to a judiciously stimulating and nourishing dietary of raw meat, eggs, milk, fresh lemon juice, and strong beef tea, with port

wine or brandy. The nasal tube and rectum may be used for purposes of alimentation. The child cannot have too much fresh air, but he can have more than enough of fresh and good food. The feeding must be left to a skilled nurse and doctor, small doses and frequently, after the plan of treatment of all very exhausting illnesses. The use of plenty of deodorising and disinfectants about the room (see Gangrene of Lung) is advisable. *A prime object is the prevention of local and general sepsis.* The bowels and skin must be carefully attended to. The former may be kept acting once a day by a dose of castor oil or rhubarb and soda; and the latter needs not only cleansing, but careful protection from chills.

Locally the surgeon should be asked to deal with the case, and he usually employs one thorough application of Nordhausen fuming nitric acid on a stick to the whole of the diseased surface. *The object is to destroy the virus of the disease.* If the child has any vitality to speak of, this usually arrests ulceration. Some prefer the actual cautery or galvano-cautery. The mouth should be thoroughly rinsed and syringed out with some alkali (carbonate of soda gr. x. to ℥ii. warm water) after the acid has been applied. It is important to check fœtor at its source, and this is done by sprays of Sanitas, syringings with Condy's fluid, or chlorinated soda solution, 1 in 10 of water—these are to prevent septic bronchitis and pneumonia and pyæmia—and also by powdering the surface of the gangrenous part with iodoform. Hot boracic fomentations may also be applied to the part to aid the separation of the slough. It is useless to order medicines until there is some chance that the case will not terminate fatally in a few days. When chronicity has become established, quinine—sulphate, or tannate, or citrate—in one-grain doses, for a child three years old, may be prescribed in glycerine and water. Iron may be given with it, preferably in the form of the tincture of the perchloride ♏v. and sulphate of quinine gr. i.

Goodhart takes a very sensible view. Cancrum oris is like charbon or malignant pustule. He therefore bids excision if the case be seen early enough.

Further treatment of gangrene.—A solution of carbolic acid 1 in 20 may be employed as an antiseptic and stimulant to the sloughy surface.

To remove the offensive odour a gaseous oxygen bath is recommended, and this may be given in the form of the vapour cone of the North Hants Chemical Company, the gas being confined within limits by means of a box. The gas is said to relieve pain and check the course of the gangrene.

An ointment of balsam of Peru ʒi. to ℥ss. vaseline is a good stimulant and antiseptic to gangrenous sores. Solutions of chlorate of potash gr. x. to ℥i. are used, especially in cancrum oris, for which disease three or four grains may also be given internally. Dusting the part with powdered animal charcoal acts antiseptically, and also as a stimulant. Wet charcoal poultices are voted useless. A lotion of quinine (gr. v. to ℥i. or stronger) has also been used to gangrenous sores. Salicylic acid has been blown on to gangrenous sores with good effect. Boracic acid lotion gr. xx. to ℥i. is a good antiseptic.

In cancrum oris strong hydrochloric acid, the acid nitrate of mercury, the liquor ferri perchloridi and nitrate of silver, gr. xxx. ad. ℥i., have been used instead of fuming nitric acid. Lewis Smith recommends sulphate of copper half-a-dram, and powdered cinchona half-an-ounce, in four ounces of water. Terebene and eucalyptol are also useful antiseptics, and may be mopped on the surface of the sore.

CHAPTER VII.

THE RESPIRATORY SYSTEM.

Peculiarities of anatomy and physiology.—The *epiglottis* is of a peculiar shape in infants; it is folded on itself like a leaf on its mid-rib. The upper opening of the larynx in the infant is therefore of different shape and size as compared with the adult. In the infant it is an oblong slit, in striking contrast with the somewhat triangular outline of the upper opening of the adult larynx. The importance of this shape of the epiglottis is that it makes the entrance to the lungs very small; and therefore renders obstruction to the entrance of air to the lungs an easier matter in the infant than in the adult.

The absolute narrowness of the trachea and bronchial tubes, and the softness of their walls, makes it easy for inflammatory conditions to cause diminution of their calibre, and thus facilitates the production of obstruction to the passage of air to the alveoli of the lungs.

The plain muscular tissue in the lungs, and the elastic tissues, are probably in great perfection in early life, and this may have something to say in explaining the ease with which collapse of the pulmonary lobules occurs. Certainly the general narrowness of the respiratory channels will help to explain why it is that any inflammatory condition of the respiratory mucous membrane can so easily bring about pulmonary collapse. The chest walls of children are also remarkable for their softness and resiliency, forming a striking contrast with the rigid chest of senility. This character of the chest wall, and the narrowness of the respiratory passages, with its inevitable tendencies, will serve to elucidate the occurrence of de-

formities of the chest as well as to explain the liability to collapse of lung. For there is a connection of the "vicious-circle" nature between these anatomical and physiological conditions. The whole matter turns on the difficulty of getting air into the pulmonary alveoli; everything seems to be opposed to the full insufflation of the pulmonary air-cells during inspiration. The feebleness of the respiratory muscles of infants also tells in the same direction. A slight inflammation anywhere in the respiratory passages is sufficient in the infant to cause enough obstruction to bring about a recession of some part of the chestwalls, and to lead to a partial collapse of lung parenchyma.

The small calibre of the respiratory tubes, the softness of the thoracic walls, the feebleness of the respiratory muscles, all tend in the same direction, and are all concerned in giving to the respiratory diseases of children some of the peculiarities they possess.

It should be borne in mind that these peculiarities are always most marked in that period which may most properly be called the infantile—the first two years of extra-uterine existence; and they are of course most evident during the first part of this period.

Collapse of pulmonary lobules and broncho-pneumonia occur with such frequency in children that special reasons undoubtedly exist for this peculiarity, and, indeed, the majority of these reasons are not far to seek. Atelectasis, or physiological collapse of lung, is the usual state of the lungs in the intra-uterine period. It is reasonable to suppose that the causes which produce this condition of atelectasis would be in operation at the time of birth, and would continue to be in operation with decreasing efficiency as the distance from birth became greater and greater. Naturally the causes of atelectasis are overcome at the moment intra-uterine existence ceases, and the first breath is drawn, but that fact does

not weaken the force of the argument implied in previous considerations. There is a tendency then to a reversion to the atelectatic condition, and this tendency, together with the infantile peculiarities in the anatomy and physiology of the respiratory system already referred to, give us some clue to the reasons for the frequency of occurrence of collapse and broncho-pneumonia in children.

The anatomical and physiological peculiarities of the respiratory organs of infancy aid us in understanding still more of the diseases which the young are specially prone to develop. Deformities of the thorax are liable to occur with great frequency in children owing to the operation of the same causes as determine the frequency of occurrence of collapse and broncho-pneumonia in young subjects. Bronchitis is a very common disease of children, and combined with rickets has a considerable share in the development of thoracic deformities. Indeed, the importance of rickets in the pathology of respiratory diseases and thoracic deformities is so great that special attention must be given to the conditions that are accompaniments of the rickety state.

Rickets increases the liability to recession of the chest walls because it makes the thoracic parietes of even greater softness than obtains in healthy infants. Again, as it weakens all the functions of the body and causes corresponding alterations in the physical condition of the tissues, it follows that the muscles of respiration must also become weaker and less efficient. Further, the distension of the belly, which is dependent on gaseous accumulation and paralysis of the muscular coats of the bowels, encroaches on the already cramped thoracic space, and thus further diminishes the respiratory powers, this diminution bearing in its train further ill-effects.

In order to understand, so far as possible, how the anatomical and physiological peculiarities of the respiratory

system of children, and especially of rickety ones, are responsible for the peculiarities of their respiratory affections, it will be necessary to regard the matter from another point of view. The accusation against the respiratory channels of children, that they are too narrow, is supported by the circumstance that any morbid condition of the walls of the breathing tubes is usually attended by a falling in of some part or parts of the thoracic walls. A slight inflammation of the larynx in children is very dangerous, not only from the greater liability, as compared with adults, to the occurrence of fatal spasm of the laryngeal muscles, but also from the ease with which mechanical obstruction, as from œdema, may be brought about. The recession of the chest walls which is the invariable accompaniment of any obstruction in any part of the respiratory passages is the most active agency in the development of the common deformities of the chest.

The deformities of the chest in children much more frequently cause a diminution in the capacity than an increase in the dimensions of the thorax. The shape and size of the thorax in children differ from the shape and size in the adult; for in place of the elliptical outline of the transverse section of the chest wall in the adult we have a circular boundary; the increase of size in the grown-up is due naturally to a general growth in most of the dimensions of the thoracic cavity. There are plenty of opportunities of examining small chests, both of the *alar* or *winged* varieties, and of the *flat* description, in children; whilst most of the deformities of the chest are met with in perfection in the practice of diseases of children.

The *transversely constricted* thorax may be described as one in which the lower sides and lower front of the chest walls are depressed, and may be contrasted with the *pigeon breast*, in which the upper ribs are driven in and the upper part of the sternum forwards owing to the fixed insertion

of the true ribs into the sternum. In the transversely constricted form which affects the *false* ribs, whose anterior ends are not fixed, the region of the chest involved in the deformity is able to undergo depression during inspiration when any obstruction to breathing occurs.

The reasons for the production of a pigeon breast in one case, and of a transversely constricted chest in another case of chronic obstruction to the entrance of air into the lungs, have never been fully explained. How it is that one case of whooping cough should result in a pigeon breast, and another in a transversely constricted shape of thorax, we do not know, even when we are daily witnessing that particular kind of recession of the walls which leads up to the characteristic deformity. The *rickety thorax* differs from both the preceding in that the groove extends throughout the whole length of the ribs, along the distal parts of the true and false ribs, behind the junction of the cartilages with the bones. The grooving is most marked in the middle ribs (5, 6, 7), in those ribs which also exhibit the earliest and most pronounced signs of "beading." The rickety chest is too flat, and a transverse section is very peculiar. The globular shape of the distended abdomen in rickets makes with the chest an outline that strongly suggests a "fiddle." Sometimes in infants a curious deformity occupies the region chiefly of the lower part of the sternum. The deformity has a likeness to a *saucer* or shallow *basin;* it is also termed the *anteriorly-depressed.* I have known this deformity to be produced by long continued bronchitis, and it also occurs as a congenital condition. The inspiratory effort that sometimes gives rise to it seems to be the effect of a strong dragging backwards of the diaphragm inserted into this portion of the chest wall.

The **pharyngeal cavity** in children is proportionately larger than in adults, and the lymphoid tissues in this

situation are prone to be active and undergo considerable swelling, so that adenoid growths project from all parts of the wall of the pharynx. I have known one case operated on in the supposition that it was one of retro-pharyngeal abscess. The tonsils may participate, and become so large that the obstruction to the passage of air through the posterior nares is exceedingly great, and often leads to the development of the transversely constricted chest, and less often to the genuine pigeon breast.

The thorax in children not only undergoes more or less permanent changes in size and shape, but also shows very easily alterations of a more transitory kind as the result of acute diseases. There is no occasion to describe these changes more fully, for beyond the fact that the alterations are produced with greater facility owing to the yielding characters of the walls, there is nothing calling for special comment. It may suffice to say that the commonest form of marked unilateral enlargement of the chest in children is that common disease of the young—empyema.

It is a cardinal feature of the respiratory movements of children that the breathing is effected far more by the diaphragm than by the intercostal muscles.

The rate of respiration in infants is more rapid than adults, and the rhythm is most variable and irregular, during waking hours. During sleep, the only time that ought to be used for accurate observation the rate under one month is about forty, under two years thirty, under ten years twenty.

Inspection and palpation.—Expiratory respiration is so named when the pause occurs just before expiration.

The weakness and high pitch of the voice renders the vocal fremitus of less value in children than in adults, but if this method can be employed the indications in the differential diagnosis between solid and fluid conditions within the chest, are more reliable than those derived from auscultation.

The "cry" fremitus often proves of service in physical examination.

Percussion and auscultation.—The physical examination of the respiratory organs in children is best conducted in the same general fashion as in the examination of adults. But the indications to be derived from the examination are not of the same value or order. There is greater variability of the physical signs in the young, and this circumstance makes a careful examination more necessary than in the adult. For instance percussion may yield a dull note in some part of the chest, and yet other methods of physical examination fail to show that there is any abnormal condition, and indeed the dull note may not be obtained on re-examination some time later. The "cracked pot" sound, too, occurs with great readiness in the percussion of yielding parts of the chests of infants; it has no pathological significance unless accompanied by other physical signs indicative of a cavity. But a very dull note with an increase in the resistance as felt by the percussed finger is a very reliable sign of disease. If the resistance is very great, and the note almost toneless, the percussion alone should strongly suggest the presence of fluid in the pleura.

The normal breath-sounds in children are widely different from the respiratory murmur of adults. No one has yet given an adequate explanation of the loudness of puerile respiration; the inspiration is accompanied with a much louder and generally higher pitched murmur audible all over the surface of the chest; the expiratory sound is also usually more audible than it is in the adult. It is well worth considering whether the narrowness of the air passages which is a feature of the anatomy of the respiratory organs of children may not be at least a partial reason for the louder and higher pitched characters of the infantile respiratory murmur.

It is necessary that the practitioner should be aware of

certain facts relating to the signs yielded by percussion of the chest in children: the note obtained from percussion of the left infraclavicular region is normally less resonant than that evoked by striking the right infraclavicular region. This difference obtains throughout life, but the difference is greater in children and women than in the adult male. I make special mention of this circumstance because I have known the notion of enlarged mediastinal glands to be entertained on no stronger grounds than a slight difference in the quality of the percussion note at the two sides of the manubrium.

Auscultation is of far less value in diagnosing morbid conditions of the lungs of children as compared with the value of the same method of examination in adults. In the diagnosis of consolidations and fluid effusions into the pleura auscultation need not be practised at all, for a solid state of lung may not unfrequently give the auscultatory signs of fluid effusions as we know them in the adult; and, on the other hand, more frequently a pleuritic effusion will manifest auscultatory signs utterly indistinguishable from those usually regarded as due to solid conditions of the lung.

The above considerations will be sufficient to explain why it is that the use of an *exploring syringe* should be frequent in the practice of diseases of the respiratory organs of children. The syringe should be employed with the same object that percussion and auscultation are cultivated—as a means of diagnosis. I have never seen any danger or untoward accident arise as the result of the use of the exploring syringe. A little emphysema of the subcutaneous tissues I have occasionally witnessed after the introduction of the needle, but even this trifling accident may be avoided if the introduction and withdrawal of the syringe be accomplished with dexterity.

Expectoration.—The act of hawking as well as that of

coughing is necessary for the proper ejectment of the bronchial secretions. The secretions from the inflamed surface of the respiratory passages in children are practically the same as those from the same parts of the adult; but we are accustomed to say that children do not expectorate their bronchial secretions. This statement holds good for children as a rule under the age of seven, though there is no reason that prevents any child from expectorating its secretions beyond the inability to hawk efficiently. Infants mostly swallow the mucus and mucopus which the ciliary action, and still more the act of coughing, bring into the grasp of the pharynx. Nevertheless, whenever the quantity of secretions brought into the pharyngeal cavity is very large, some of it not unfrequently escapes by way of the mouth and nose, and this may happen with a child of any age. It should be remembered that the act of hawking, like that of properly blowing the nose, is acquired with greater facility by some children than others.

ENLARGED MEDIASTINAL GLANDS.

The diagnosis of enlarged mediastinal glands is often made, and, as I have occasion to know, not unfrequently erroneously. It is impossible to be absolutely certain of the absence of enlarged mediastinal glands. When the tumour in the mediastinum is of such dimensions as to cause a great number of symptoms of compression of thoracic structures—which is not often the case—a fairly safe diagnosis may be made. In the absence of such a combination of symptoms, however, there is a certain conjunction of signs which may give good grounds for believing in the existence of large mediastinal glands. These are marked dulness in the manubrial region or the corresponding scapular space behind; the presence of abnormally bronchial breathing over or about the dull areas;

the existence of loud venous hums, systolic murmurs, or accentuated cardiac sounds about the same places. Most of these signs are increased by strongly retracting the head. Doubt no longer hangs around the notion that large glands pressing on the pneumogastric is *a* cause of the peculiar kind of coughing that is most frequently heard in hooping cough. Spasm of the larynx is set down also to enlarged tracheal and mediastinal glands.

THE TREATMENT OF CATARRH.

Children of all ages and both sexes suffer from catarrh of the nasal and pharyngeal passages, but neither do the symptoms nor the pathology differ in any remarkable way from the same affections in the adult. Children more easily take "cold," and the catarrhal affections of the respiratory mucous membranes are, therefore, of greater relative frequency in them; moreover, there is a greater liability to the spread of the catarrh from one part of the mucous membrane to another. A closer sympathy seems to exist between allied functions and structures in the young as contrasted with adults; certainly this contrast is merely one of degree, and it may perhaps be better expressed by saying that the chance of a nasal catarrh spreading to the bronchial tubes in children is three or four times as great as in adults.

An ordinary catarrh of the nasal mucous membranes may also illustrate another general principle in the pathology of children: the temperature of the body of children is more easily disturbed by any acute affection than is the temperature of adults; the disturbance of temperature is also more erratic in the young; it is less subject to the ordinary laws of pyrexia, and prognostications with regard to the course of the body-heat are apt to be sadly out of the reckoning. Usually the fever that attends an uncomplicated case of catarrh of the upper respiratory passages does not rise above 101° of the Fahrenheit

scale, but now and again, without obvious reason, the temperature may reach 105°, with a corresponding increase in the severity of the nervous symptoms, drowsiness, convulsions, or delirium being prominent signs. Whatever the explanation may be, it is certain that these eccentricities are far more often met with in children than the grown-up. It may be that some of these unusual cases are masked forms of measles, measles without the rash; but if so, there is nothing to guide us in diagnosing the cases beyond the fever and attendant nervous phenomena already mentioned. The greater liability of children to suffer from catarrhal affections of the respiratory mucous membranes is partly to be explained, or to be connected in some way, with their greater susceptibility to the deteriorating influences of unwholesome atmosphere. This unwholesomeness of atmosphere shows itself in many ways: the air may be too cold, too moist, too much charged with inorganic and organic matter, including also various forms of micro-organisms. All these objectionable characters of atmosphere tell with greater severity on the living tissues of the young, whose "vitality" must be placed at a figure considerably below that of manhood, or, indeed, any other period of existence. In order to lower the vitality of infants, it is merely necessary to keep them in the nursery with the door and windows sedulously closed for a single day. A ride in the perambulator in cold, moist air would then be amply sufficient to induce a catarrh of some part of the mucous membrane.

Treatment depends largely on the *cause*. The catarrh may be a pure neurosis, as many hold. But frequently, at all events, there is some distinct cause (contagium or special excitant, haypollen, ipecac., &c.) that sets the reflex arrangements of the naso-pharyngo-laryngo-bronchial mucous membrane out of order.

All treatment aims at *restoring the reflex mechanism to*

normal modes of action. Remedies exist to lessen reflex excitability, morbid local irritability, and to arrest secretion. *General measures* for effecting all three objects: The *atmosphere* supplied to the infant must be warm, pure, and of a certain degree of humidity, about 65 per cent. of saturation. In bad weather the hygienic nursery is, therefore, indicated. In summer and fine weather the infant suffering from catarrh may be out in the perambulator under the shade of the trees, but not in draughty quarters. The uniform atmosphere lessens sneezing, secretion, and uncomfortable sensations. Great care is required in scrofulous and rickety infants lest collapse of lung and broncho-pneumonia supervene by mere *spread* of inflammation.

The *Diet* requires but little alteration. Over-feeding is bad. It surcharges the blood, gives the excretory organs more work to do, and probably increases the morbid irritability of the disordered reflex mechanism.

Thirst is relieved by small doses of iced water, orangeade, or lemonade, or glycerine to the lips and tongue. The bowels must be evacuated once a day, by a mild laxative, if necessary, (capsule of rhubarb and soda, gr. v.-x., or liquorice powder, or Dinneford's fluid magnesia), or by gentle irritation of the rectal mucous surface by a tiny piece of soap. *Severe purging is bad.* It may help to get rid of the poison in the blood, and may lower reflex activity of sneezing centres, but it causes catarrh and lowers strength. Purges should be avoided in rickety and scrofulous infants, because they would aid the *spreading tendency* of infantile catarrhs. Most necessary is minute attention to practical details in the new-born, whose lungs may collapse almost in the "twinkling of an eye," like a child's elastic air ball. The coexistence of catarrh of the stomach or bowels somewhat modifies diet and treatment. (See special sections.)

Internal remedies.—*Sedatives* to lessen reflex activity—

opium, bromide, chloral. Dover's powder is excellent for children of all ages. It lessens secretion and lowers reflex activity. A grain dose repeated and watched is a good method at any age. Some prefer a large dose, gr. v. or x., for a child of five or ten. The practitioner should be cautious with bromides for young infants, because of the large plaques of cutaneous eruptions they may excite. Chloral is very suitable, but requires careful attention—a grain in syrup or glycerine may be repeated according to circumstances.

Expectorants to remove local irritation.—Ipecacuanha wine in three or four-mimin doses every four hours, for an infant a year old. Dover's powder contains ipecacuanha. But I use both. The latter may be combined with liq. am. acet. (See below).

To arrest secretion.—Belladonna is anhidrotic, and should be combined with large doses of diaphoretics. Belladonna drys the throat and nose, lessens the sensitivity of nerves, and in small doses stimulates the chief vasomotor centre. Ten-drop doses may be given to a child two years old.

Diaphoretics to lessen secretion by *derivation*, and to eliminate a supposed poison or cause of catarrh. Some catarrhs may be due to obscure gout or rheumatism, and where diaphoresis does so much good, perhaps these fashionable causes are at work.

℞ Liq. Am. Acet., ♏x.
V. Ipecac., ♏iv.
Aq. Menth. Pip., ad. ʒi.

Camphor water or chloroform water may be used. The mixture may be given in milk.

Counter-irritation to check catarrh. The skin of the front and back of the neck and thorax may be irritated by liniment of ammonia or turpentine.

Local measures to ease morbid sensations, coughing, and

sneezing. *Anæsthetic* to sensory nerves. Many authorities attest the value of this method. I entirely approve, and have adopted it for more than a year. Cocaine hydrochlorate five per cent., painted up the nose, and specially on the turbinate bones carefully mopped or brushed on to the back of the throat, fauces, and epiglottis a few times a day. A small pledget of absorbent wool soaked in 7 per cent. cocaine and placed in the nares. Insufflations of menthol two parts, with roasted coffee 50 parts, and white sugar 50 parts. Ferrier's snuff of bismuth and morphia may be used carefully for older children. *Antiseptic* on the theory that there is a local germ, a poison causing the symptoms. Sprays or syringings of one per cent. resorcin, or carbolic acid.

Protection from irritation by air, germs, &c. Pledget of wool in each nostril. Painting the mucous membrane over with glycerine or vaseline. Cleansing the nostrils from crusts and scabs which should not be allowed to form. Water should not be used, but sweet, or weak carbolic, oil. During *Convalescence.*—To prevent chronicity of catarrh. *Astringent and antiseptic.* — Insufflation or painting with ointment by camel's-hair brush : iodoform alone or tannin diluted four times with starch. Cod-liver oil ʒss. t.d.s. (see Scrofula for modes of administration). Chronic forms of rhinitis sometimes begin a long career as an acute catarrh —especially in the rickety and scrofulous.

To break the habit of catarrh.—Catarrhs tend to recur in the same individual. General and personal *hygiene*, proper clothing, invigorating douches, avoidance of over-crowding, cold, and wet—are important preventives. *Massage* and *exercise* in pure air improve the circulation and excretion, and so promote the collective health. Invaluable are daily *douches* of cold water with due precautions. The douche does no good, but harm, if reaction does not follow the stimulus or shock. *Preparation of water and patient* may

be necessary. The water must not be used too cold when the treatment is commenced. It may be not colder than 80° for feeble folk to start with. The douche should be given in front of the fire or stove. The feet may be immersed in water at 100°. The infant stands or sits, and a gallon, half-a-gallon, or less, according to the infant's vitality, is poured from above over the head, shoulders, and trunk. The effect or shock is greater or less as the height of the pitcher is greater or less above the head. It will be seen that we have the agents completely under control. We can graduate our therapeutic agents to a nicety. The douche is best given in the morning on removing the patient from bed. The child should be thoroughly warm all over. It is advised, if necessary, to prepare the patient by thorough shampooing of the whole body before the douche (Eustace Smith). I should recommend the massage afterwards, to secure and promote a thorough reaction. A *small* cup of warm milk may be given to the feeble child before rising, but a breakfast is not advisable, for the shock may stop stomach secretion. In some children two or three hours after breakfast is more suitable, for they are then refreshed, not only by the night's sleep, but by the morning's food; and reaction would be more ready. Immediately after the douche the child should be rapidly wiped dry all over with a large stout towel sufficient to envelop him. The skin may then be rubbed till it glows. He may go back to his warm bed for few minutes to ensure perfect reaction. The precautions are not wanted when the reaction is ready and the child fairly vigorous.

RHINITIS.

In *scarlet fever* and *diphtheria* the mucous membrane of the nose not unfrequently becomes the seat of an inflammation that shows itself by an ichorous excoriating discharge from the anterior nares; the discharge may be thin

and watery, or muco-purulent. The upper lip and nose become infiltrated as the result of the irritation of the discharge; there is injection of the conjunctiva, and the tears may flow over the eyelids as the result of obstruction of the lacrymal duct (epiphora). Sometimes a membranous exudation of diphtheritic sort may be seen on the mucous membrane of the nose by inspection through the anterior nares. I have known cases of diphtheria of the region of the posterior nares and contiguous part of the pharynx to give no other local signs than those of a rhinitis. The mucous membrane swells so much in some cases of rhinitis, whether primary or secondary, that respiration may be impossible through the nasal passages. A snorting or snuffling noise usually attends the inspiration. In cases of rhinitis, as in cases of large tonsils, the noise is generally louder and more constant during sleep. In diphtheria and scarlet fever the occurrence of a severe rhinitis, as above described, must be regarded as of serious significance; the nasal inflammation is generally, I believe, of septic origin by local infection rather than a direct extension of the primary disease, *i.e.*, the rhinitis is not strictly diphtheritic or scarlatinal, or only so occasionally. It is certain that cases of membranous rhinitis do occur in which the membrane is limited to the strictly nasal passages. Whether these cases are of specific (diphtheria) or more simple character it is impossible to say, though probably they sometimes partake of the one and sometimes of the other nature. Syphilis and scrofula are the commonest causes of a chronic rhinitis, but repeated attacks of ordinary catarrh lead up to a chronic rhinitis which cannot be regarded as either scrofulous or syphilitic, though its local consequences may not be very different. These chronic diseases spoil all the tissues in their neighbourhood, the bones may become swollen like the softer tissues, and necrosis of cartilage and bone may occur; the bridge of

the nose may become "squat," or taken quite away; the upper lip and wings of the nose may become infiltrated, ulcerated, and scabbed over, and may form likely foci for the development of erysipelas, which is apt to spread over both cheeks and considerably lower the general health, thereby keeping up the chronic local disease. A common picture in scrofulous children is compounded of breakings out on the head, with eczema of the face and ears, otorrhœa and ophthalmia, the lymphatic glands of the head and neck being swollen also.

Treatment.—The treatment of the chronic forms of rhinitis should be conducted on the *antiseptic* and *hygienic* principle. The immediate removal of all excreted matter which, being dead, forms a nidus for the development of all sorts of micro-organisms, is an object of the first importance; this removal should be effected by the use of the camel's-hair brush and sweet oil. When the sores are cleaned of all scabs antiseptic and "healing" salves should be applied. The nasal douche or syringe may be used to clear away the thick crust from the nasal passages at least twice a day.

Antiseptic.—There are many applications for keeping the nose sweet. I employ the ointment of iodoform twenty to thirty grains to the ounce of vaseline, geoline, or fine lard; some of this may be placed as far up the nose as possible by a fine soft brush, or the finely-powdered iodoform may be blown up each nostril every morning. Constant care and attention to the case for a long period is the surest way of effecting an improvement.

Alterative and astringent.—The number of topical applications is legion. It is useless to mention them all, but I will say a word in favour of the application of a strong solution of nitrate of silver to the ulcerated and inflamed surfaces.

General tonics.—Sea air, and this for as many hours out of doors as possible, with sea bathing and the administration of cod-liver oil, syrup of iodide of iron, or of the hypo-

phosphites, or phosphates, and plain diet of underdone meat, milk, new-laid eggs, with some mashed vegetables and stewed fruits, due allowance being made for size and age and complicating conditions, are the best means to promote a return to the normal standard of health. (See Scrofulous Ozæna.

DISEASES OF THE LARYNX.

A great deal of unnecessary confusion exists with regard to the nomenclature of diseases of the larynx. This confusion arises, I believe, from a greater attention to words than to facts. The chief fact is that the larynx, especially during the first years of life, is exceedingly liable to attacks of spasm of the constrictors, or, as some will have it, to paralysis of the muscles with consequent collapse of the larynx and obstruction to the entrance of air. If it be borne in mind that the spasm or obstruction may be the only disease of the larynx, and that it may complicate all other diseases of the larynx, a great step towards lucidity will be made in advance.

Laryngismus stridulus.—This is a name given to an attack of spasm of the larynx when no other condition than the neuro-muscular one is present. Child crowing, false or spurious croup, spasmodic croup, thymic asthma (of the old authors) are synonyms.

Laryngismus is an affection more frequent at night time, especially in the early hours of the morning; it is most frequently witnessed in infants a few months old, and the male sex suffers more than the female. Infants who are liable to it are very prone to have convulsions, tetany, and "facial irritability," by which is meant a contraction of the facial muscles on percussing the region of the facial nerve as it lies in front of the parotid gland. I think laryngismus must be regarded as a kind of tetany of the laryngeal muscles. As to its connection with rickets, all that I can say is that I have

generally seen well-marked beading of the ribs in cases of laryngismus; but it is not so common to see laryngismus in cases of pronounced rickets occurring about the age of eighteen months. That the causes that lead up to rickets are also those that induce laryngismus I do not doubt. The disease must be regarded as evidence of an hereditary or acquired neuropathic disposition. That every variety of bad feeding and want of hygiene—want of washing, good clothing, fresh air, and proper regulation of sleep and food, are causes of spasmodic croup is, I believe, true and just, but why the scrofulous diathesis should be shouldered with the sin of spasmodic croup passes my comprehension. Tossing a child up in the air has brought on an attack. Various exciting causes have been enumerated, but most of them can hardly be looked upon than as the "last straw" in the causation; such are the act of swallowing, a draught of cold air, fright and shock. Pressure on the trachea by an enlarged thyroid or by other large glands or retro-pharyngeal abscess may cause laryngeal spasm. The symptom of laryngismus is an obstruction, more or less complete, to the passage of air through the larynx. A typical case begins with complete closure of the glottis. The infant becomes blue in the face, is awakened by the curious sensation of inability to breathe, struggles, grows hot, and frequently breaks out into a sweat; then, or before so many signs of impending suffocation appear, a long-drawn "croup" or "crow" is heard, indicating an obstructed inspiration; the asphyxia lasts a little longer, may be attended with incipient or fully developed convulsions, and the passage of the urine and fæces, but then terminates, leaving behind it no more discomfort than would attend a single act of partial suffocation however induced. It is noteworthy that neither the cough nor the voice or cry is altered by an act of spasmodic croup. This is important as [illegible]ishing an attack due to, or associated with, slight

catarrh. Moreover, there is usually no febrile movement. The tendency for the attacks to be repeated is a marked feature of this nervous affection of the larynx. The pathology of the affection may be summed up as a state of excessive irritability of the laryngeal neuro-muscular apparatus, but whether central (most probable), or peripheral, or muscular, we cannot say, though it may be sometimes one and sometimes the other. A child may die in an attack of the spasm; probably some cases of "overlaying" are of this causation. The severity and frequency of the fits, the state of the health, and the presence of removable causes determine the prognosis. Traction on the tongue has been practised. A powerful impression on some of the sensory nerves of the chest and neck is the best treatment of the attack. The induction of vomiting by tickling the fauces and smelling salts to the nose, also a sudden plunge into the hot bath are useful measures. Lancing the gums, if the teeth prove a source of irritation, is recommended. Chloroform has proved of service, and tracheotomy has had to be performed. The treatment of the case during the intervals is most important;* attention to the diet and other matters likely to remove the irritable state of the nervous system must be carried out, and this will include everything that comes under the head of good hygiene. Fresh air is of the utmost importance. Hughlings Jackson believes that mere supervenosity of blood is the determining cause of the attack.

INFLAMMATION OF THE LARYNX.

The larynx of infants may be the seat of *catarrhal*, *œdematous*, and *membranous* inflammation. As to the terms croup and diphtheria, all that it is necessary to know in the present state of knowledge may be thus summed up. Croup is a name for the spasmodic seizure which is liable to occur with any affection of the larynx. But

* It is the treatment of Rickets.

the word croup has another meaning: it signifies membrane in the larynx as contrasted with diphtheria, which means membrane in the pharynx at least, and this regardless of its presence or not in the larynx. Sometimes a distinction has been drawn between croupous and diphtheritic membrane: the former being said to be an exudation only on the surface of the mucous membrane, whilst the latter lies not only on the surface, but sends roots into the substance of the mucous coat. It is needless to say that the question whether all false membranes are of a diphtheritic nature or not is still unsettled. Clinically I think it best to regard as diphtheritic all solid exudations. That other agents than the cause of diphtheria may give rise to an inflammation with a membranous exudation is well known—the experimental kind caused by ammonia to wit.

All the forms of laryngitis are very common in children, and the inflammations are apt to prove of the severest kind in them. A low degree of vitality, however induced, of which unfavourable sanitary conditions with exposure to the weather are two of the most powerful causes, is the greatest predisposing cause of laryngitis.

There is nothing very special in the causation of laryngitis of children as compared with adults. Œdematous laryngitis occurs not unfrequently from swallowing hot water imbibed from the spout of the tea-kettle in the homes of the poor. Sufficient œdema of the submucous tissues to cause mechanical obstruction to the passage of air through the larynx is very easily brought about in children. Erysipelas about the nose sometimes travels as far as the epiglottis with fatal result. Measles is usually attended with laryngitis, as the hoarse cry and voice sufficiently prove, even if there be no more alarming symptom. Diphtheria of a severe type is apt to occur a few days or a week after the measles rash; no matter how early the case is taken, tracheotomy

seems generally powerless in such cases where the tendency for the membrane to spread along the trachea and bronchial tubes appears to be very pronounced.

Scarlet fever and typhoid fever may also be complicated in children with membranous laryngitis. The inflammatory swelling of the lymphatic glands of the neck is usually very considerable in children, probably in correspondence with the great activity of the lymphatic circulation and lymphatic tissues of the young. Sloughing of portions of the mucous membrane of the epiglottis and its pharyngeal neighbourhood is not uncommonly seen in the post-mortem room, and may be suspected from the presence of an overpowering stench at the bedside of the sufferer.

The symptoms of laryngitis are the same practically in the child as in the adult; special attention should be paid to the hoarseness of the cry, to the croupy or clangy quality of the cough, and to the occurrence of attacks of shortness of breath of the laryngismus stridulus character; the speechless child indicates the chief seat of its misery by grasping the throat at the site of the larynx.

Diagnosis.—The diagnosis of diseases of the larynx in the young, and especially in the infant, presents very great difficulty, but it is not difficult, with the exercise of a little clinical industry about the diphtheria wards, to acquire as much skill in the diagnosis of laryngeal conditions as most physicians possess. The following points should be constantly before the mind: the mode and time of onset of the illness and the state of the body temperature, the presence of any deposit on the fauces or pharynx, and the existence of a nasal discharge, the condition of the glands about the angles of the jaw, the presence or absence of albuminuria, and also of epistaxis.

The detection of a deposit even of follicular sort on the tonsil is regarded as the strongest evidence of the membranous nature of the laryngeal disease; albuminuria and epistaxis

also favour the diphtheritic view of the case, and a slow mode of onset with gradually-developing signs of weakness, accompanied by inability to swallow without discomfort and enlargement of the cervical glands, also point to membrane in the larynx. Remember that general symptoms, such as languor, distaste for food and play without any sign pointing to the throat, are sometimes the only early indications of diphtheria or pharyngitis of any kind.

A history of diphtheria in the house or neighbourhood from which the child comes is of course of considerable value in the diagnosis. Lastly, the majority of cases of continued laryngeal obstruction in infants under two years are in my experience of a membranous nature. Catarrhal laryngitis seldom causes the prolonged and frequent attacks of dyspnœa that is the lot of membranous laryngitis; and in young infants of a few months the danger of suffocation from severe catarrhal inflammation is so great that I am disposed to have tracheotomy performed as soon as hot baths and hot flannels to the neck and the steam spray in the tent bed, an emetic and a purge have failed to ward off the attacks of spasm of the larynx that seem every few minutes to threaten the termination of the case.

Indications for tracheotomy.—The indications for tracheotomy are simple and plain even to ugliness. If there be signs of increasing obstruction to the entry of air into the lungs shown in the pallor or cyanosis, and still more in the weak voice and increasing recession of the walls of the chest, the knife must be used, regardless of the supposed nature of the laryngeal obstruction. My experience is decidedly in favour of early tracheotomy; to wait till tracheotomy is performed as a *dernier ressort* seems to me the very essence of bad doctoring. I make no reservation from a point of view of age of the patient.

The presence of membrane (very difficult if not impossible

to diagnose) in the bronchi should be no bar to the operation. Such cases will in young children be almost inevitably fatal. Tracheotomy is done to stop one source of obstruction to blood oxygenation.

Pneumonia and other general diseases (scarlet fever, measles, and pertussis) likewise make no difference in the indications for tracheotomy. They lessen the chances of recovery, but do not contra-indicate operation. With all due deference to authority, I hold the same argument when diphtheria is more deadly and extensive.

In my experience tracheotomy early performed and properly managed has saved many lives. The after management of cases of tracheotomy is an important matter, requiring the careful attention of a skilled nurse and sound surgery. I prefer the use of a silver tube at first, and an india-rubber one as soon after as possible. I think it highly desirable that the tube should be removed as soon as may be, and this may at times be accomplished in a day or two. Even removal for a few hours at a time should be practised. I cannot but think, also, that the tube is a sort of *bête noire;* and, therefore, though indispensable, to be got rid of at the earliest possible date. The presence of the tube has at times seemed to me by its mechanical irritation to increase the rate of spread of the membranous inflammation to the bronchial tubes; but for all this I am confident that it should not deter the early performance of the tracheotomy. There is another reason for the discontinuance of the tube at the earliest period possible. After the child has become accustomed to breathe through the tube it seems as though the act of breathing through the natural passages falls into abeyance; so that on the temporary removal of the tube respiration seems impossible and suffocation looks imminent. This condition happens usually when the tube has been worn at least a few weeks. The difficulty of

removing the tube is no doubt a great one, but it should be attacked energetically ; by which is meant the tube should be removed whilst the surgeon sits beside the child, who should be encouraged to persevere in the trial to breathe through the natural passages ; I have known this ruse to succeed when the case had been thought to be hopeless. In some cases the removal is not possible until the child has grown somewhat, and the general calibre of the respiratory passages has increased as the result of the natural, though in these cases slow, development of the body. The impediments to the withdrawal of the tube are numerous. Sometimes the affair seems to be one of pure apprehensiveness on the part of the child ; sometimes the tube seems to have set up certain local conditions that prevent the normal acts of respiration. Such are paralysis of the laryngeal muscles, induced either by local changes in the laryngeal tissues or by the actual extension of mischief to the nerves that supply the vocal and respiratory apparatus ; not unfrequently small polypi or masses of chronic granulations form the mechanical obstruction. The vocal cords may become adherent. For the treatment of these conditions, surgical works should be consulted.

Intubation of larynx instead of tracheotomy.—It is contended that it is equally efficient, that the laryngeal tube causes less irritation than the tracheal canula and that there is less danger of pneumonia, because there is no open wound. The tubes have varied greatly in shape and size. O'Dwyer uses one with the antero-posterior diameter greater than the lateral. The head of the tube varies in size, and some are directed backwards ; the shoulder rises either gradually or abruptly from the middle of the tube. The large head prevents the tube slipping into the trachea. This recurved head allows the epiglottis to close more perfectly over it, and renders deglutition easier. The tubes are not yet self-retain-

ing. Some of the tubes are thinner, others thicker. Some are made of flexible gum elastic material, others of vulcanite or xylonite. They are very liable to get dirty, and are by no means always well-borne. They may set up ulceration of trachea, and are almost as much *bêtes noires* as tracheotomy tubes. To introduce the tube the child is held firmly in a sitting posture, on the lap of the nurse, with the hands to the side. An assistant holds the head firmly backwards. A mouth-gag is used, or the finger introducing the tube must be carefully guarded. The tube is passed over the epiglottis, which is lifted up by one index finger. Some use an introducing instrument. Practice should take place on the cadaver. I cannot recommend intubation.

The **treatment** of Catarrhal Croup or Laryngitis Stridula.—Although no age is exempt from catarrhal croup, yet it is specially prone to occur in children from the age of two to seven. The pure neurosal laryngismus stridulus is most frequent before the age of two years. The treatment resembles so closely that for laryngeal diphtheria that the two may be considered together. The child is often in bed when the disease sets in, because it occurs at night time, and suddenly, almost without warning. The cot should have a tent erected around it, and the *bronchitis kettle* should be set boiling, so that the air within the tent is rendered warm and moist. It is a great advantage to use the carbolic spray—one part of 1 in 20 carbolic solution to four parts of water. The vapour of carbolic acid reaches the larynx, and exercises a beneficial anæsthetic effect that tends to prevent the recurrence of spasm and attendant dyspnœa *

Emetics.—It is well in all cases of sudden laryngeal obstruction to make the child *vomit*. I generally use dram doses of ipecacuanha wine, repeated as often as necessary.

* Sprays of sulphurous acid and five per cent. solution of tannin have been employed.

Usually one dose, if the finger be put at the back of the throat, will prove effectual.

Teaspoonful doses of alum, as in membranous diphtheria, are strongly advised by Meigs and Pepper, given in syrup or honey, and repeated every ten minutes.

If the child can be got to take it, say when he is five years old, two teaspoonfuls of *mustard*, in hot water, is very good. But of late I have used successfully the method of small and frequently repeated doses of *sulphate of copper*, half a grain every ten minutes, and tickling the throat frequently.

Tartar *emetic*, as an emetic, is now discarded by most authorities in true croup. The *yellow sulphate of mercury*, in repeated 3-grain doses, is prized by some. I do not think the copper has any especial action on the larynx, and ten grains of *zinc sulphate*, followed by a second dose of five grains, will answer equally well. These doses will do for a child three to four years old. Emesis lessens the spasmodic element, as well as removes foreign matter from the respiratory passages. A hot *bath*, at the temperature of the body, 98° F., for ten to twenty minutes, also abates spasm, and should be ordered in catarrhal croup.

Purgatives.—Like asthma, this spasmodic catarrhal croup is often apparently caused by a loaded state of the primæ viæ, and there is nothing more necessary in the treatment than a sharp mercurial purge. Some practitioners object to the mercurial, but in this single dose it is most beneficial. The calomel may be put on the back of the tongue, and a saline (fluid magnesia ʒi.) may follow.

℞ Calomel, gr. ii.
Pulv. Scam. Co., gr. vii.

for a child three years old; or, ℞ Calomel gr. ii., and Jalapine gr. ii., may be put on the back of the tongue, and washed down. *Mercury*, in repeated doses, should never be used.

Local Applications.—*Revulsives.*—Another valuable agent

for abating acute laryngeal obstruction is a piece of spongiopiline, on which, a little before its application to the front of the throat, boiling water has been poured; or a sponge, with very hot water, may be used instead. It does not matter even if slight vesication should follow its application to the front of the neck. Indeed, actual scalding is recommended by some practitioners, but the water need not be so hot as to do that. A leech is good, and to be applied to the manubrium or over the larynx; but I do not use this method, and have seen but one case of the kind in which it was employed. The mustard foot-bath, or sinapisms to the back or front of the neck, may be used. Emetics and hot baths are more effectual in urgent cases. Cold wet compresses of lint under oil silk, are preferred by some to hot applications, both in simple laryngitis without spasm and without bronchitis. They are, at least, as good as hot fomentations.

A mere pad of cotton wool will be sufficient in slight cases.

A mustard bath for the whole body is a powerful revulsive, should the simple hot bath fail; it depresses the circulation, causes sweating, lowers inflammation, and is anti-spasmodic. Blisters are sometimes applied to the neck to relieve the spasmodic obstruction, but hot water on a sponge is preferable. Blisters should be avoided as far as possible in all diseases of children.

It is very essential to remove the spasmodic obstruction as soon as possible, for the oftener it is repeated the more the *habit* of spasmodic croup becomes established; it seems to be almost as much a neurosis as laryngismus stridulus.

Diaphoresis.—When the spasm has passed away a diaphoretic mixture may be ordered every four hours.

℞ Liq. Am. Acet., ℥xx.
Vini Ipecac., ℥iii.
Glyc., ℥xx.
Aq., ʒii.

Alkalies internally are claimed by some to effect benefit. Carbonate of potash gr. ii., with syrup of tolu ♏x. Aq. ʒii. t.d.s. Some combine with it a few minims of antimonial wine and senega. This is not to be recommended.

Cough.—If the cough be troublesome a drop of liq. morphiæ may be added to this, or three drops of Tinct. Camph. Co., or five drops of belladonna should the cough be very explosive.

Depression of circulation.—Many practitioners also add five drops of antimonial wine as a depressant to prevent spasm and lower the blood pressure. But if there be great excitement of the circulation, and much restlessness after the acuteness of the spasmodic attack has subsided, I prefer to use aconite in drop doses of the tincture every twenty minutes, until some effect is produced.

Convalescence.—During the day succeeding the nocturnal onset, the child should be confined to bed with the steam spray. He will probably object to this, but should be amused with pictures and toys. Although there may appear to be but little the matter with him, still it is well to keep him in bed for a day, as I cannot help thinking that such measures will tend to prevent relapses. If there be any elevation of temperature, which is frequently slightly raised to 99-100, the bed should be deemed still more necessary.

As a rule, the treatment above indicated need not be continued more than 36 hours; the complaint left untreated often lasts three or four days.

It should not be forgotten that occasionally the catarrhal croup is the preface to a genuine membranous croup. The *diet* in cases of spasmodic (catarrhal) croup should be of the unstimulating kind, but need not be restricted to slops. A little fish and milk pudding may be allowed in the daytime after the night attack, if there be no fever and no complication like bronchitis or pneumonia. For it is also a fact that the spasmodic laryngitis may be the initial symptom

of severe bronchitis or broncho-pneumonia; the anxiety which fastened itself to the larynx in the night changes its venue to the lungs next day. But this is rare. Meigs and Pepper correctly advise that meat and most vegetables be avoided until convalescence is established. I say prevent constipation and overloading of bowels.

Treatment of chronic state.—*To remove the nerve habit.*—Bromide of ammonium or sodium may be given, after the 36 hours have passed by, in 2-grain doses three times a day, with a view to diminish the nervous susceptibility which is operative in the recurrence of the laryngeal obstruction. Some use chloral in gr. iii. doses three times a day for a child of three. Opiates are also employed here, as in hooping cough, to dull the nervous sensitivity, but I prefer the bromides. Dover's powder in gr. ii. nocturnal doses often removes the harassing *cough*.

There is no disease, perhaps, but asthma that needs more *prophylactic treatment* than this hereditary spasmodic croup, and consequently the intervals between the croups should be devoted to removing the nervous habit of body which is the boy's or girl's inheritance. The circulation should be kept efficient by warm woollen clothing *cap-à-pied*; by outdoor exercise in the fresh air of a suitable climate (Bournemouth is good for most of the cases); by the avoidance of all fatigue, and by the careful regulation of the dietary, though there are no hard and fast rules to be laid down here. It is essential that some fat be eaten; some bacon fat at breakfast is usually acceptable to a child. Too many eggs and too much meat are generally provocative of attacks, probably by giving the liver too much work to do in metamorphosing the peptones brought to it, or, indeed, by the pancreatic and gastric juices being taxed beyond their powers. The bowels must be daily evacuated. If the circulation be fairly good, a *cold sponge down* every morning before dressing and breakfast, but

after the ingestion of a cup of warm milk, is usually beneficial. Even when the circulation is feeble, this treatment should not be lost sight of. The child may stand in the hip bath in front of a good fire, the feet being covered by warm water; a pitcher of water at a temperature of 65° F. may then be poured over him. He should be immediately wiped down, wrapped in blankets, and put to bed again to ensure a "glow." The water may be used colder as the strength of the patient becomes greater, and he need not then be put to bed again, but rubbed well all over with a rough towel until thoroughly warm. I do not wish to advocate massage for every disease, but this complaint, like scrofula and some others, is eminently one that is benefited by a *massage* of fifteen minutes once a day. It is best to give it shortly before going to bed, as it acts as a sedative, and sound sleep is a great warder off of attacks. I say this in spite of the fact that the child is often awakened from his sleep by the attack. Inquiry should be made whether the child dreams, and the cause of this should, if possible, be found out. A want of regularity in the meals or some derangement of the bowels will usually, but not always, explain the dreaming.

Treatment of relaxed throat.—Nitrate of silver gr. v. to ʒi.; applied to the fauces by means of sponge, mop, or camel's-hair brush; once a day for a few days, then every other day. A long and relaxed uvula should be treated by the application of lunar caustic, or snipping off the end.

Of the treatment of **œdematous laryngitis** by *calomel*, I have no experience, but Dr. Bevan, of Dublin, has had much success with it. The calomel is given as soon as the child is seen, in grain doses every half-hour, until the passage of green stools, which usually happens in eight to twenty-four hours, indicates that the system has become affected. Blue ointment is infricted into the larynx (I should not object to this

part of the treatment). But if the hot steam, local applications and emesis by sulphate of copper failed, whilst the voice was growing weaker and the chest walls receding with inspiration, I should put an end to the laryngeal excursions and stridor, and the patient's profound distress, by performing *tracheotomy*. These cases, indeed, should be regarded as more like diphtheria of the larynx than anything else. A *supporting* plan of treatment is necessary, therefore the patient's strength should not be exhausted by calomel, or by waiting for tracheotomy as a *dernier ressort*. It is true that the cases sometimes differ from diphtheria in possessing a very obvious cause (drinking boiling water), and for these occurring in previously robust children the calomel treatment may have a trial, but for those œdematous forms which occur as the result of acute disease (typhoid, erysipelas, small-pox) it must be condemned. In the œdema of Bright's disease, which also occurs occasionally in children, and in that which may rarely occur in the course of chronic laryngitis in children (tubercular or syphilitic), tracheotomy should, as a rule, be performed. The tracheal tube is not so great a *bête noire* in simple or œdematous as it is in diphtheritic laryngitis.

Membranous laryngitis is treated generally and medicinally, like catarrhal spasmodic laryngitis. (See Diphtheria.)

Alkalies are highly prized by some. Citrate of potash and chlorate are those generally used, and in combination with iron. I prefer adhering to iron alone internally in the absence of spasm and obstruction. The alkalies are given in large doses frequently, beginning with two grains for a child of three. They are said to promote the *separation* of membrane.

Anti-spasmodics as under catarrhal croup. Opium is lauded by some, as Dover's powder or tincture. I cannot recommend it. If there be much bronchial obstruction it is injurious. It depresses the respiratory centres, and lessens

the power of the child. Baths, local applications, and emetics are more effectual, and not so depressing.

Topical treatment is the same as that for pharyngeal diphtheria (q.v.), but I do not advise any interference with membrane in the larynx. It is difficult to carry out. Any loose membrane should be detached both before and after tracheotomy. The sprays, and vapors, and applications are used for the same purposes as in the pharyngeal affection, *i.e.*, to separate the membrane, to dissolve it, and to prevent its reproduction.

Chronic laryngitis.—*Syphilis* is the commonest cause of chronic laryngitis; but chronic inflammation may result from an attack of membranous or catarrhal disease, and may accompany the development of new growths in the larynx. The symptoms are hoarseness of the voice and obstruction to the breathing of a chronic kind, though acute dyspnœa frequently occurs, either as the result of spasm of the muscles or as the effect of a fresh exudation into the submucous tissues. The inspiration is usually attended with a stridor, and if the mechanical obstruction be considerable the expiration is also of an audibly noisy character. The sufferer, then, from a chronic laryngitis may appear from time to time to be the subject of genuine croup; this is easily explained if the truth be remembered that croup as a symptom is merely an acute attack of obstruction to the passage of air through the larynx. The cough may be very distressing. (See p. 196.)

The *treatment* of chronic laryngitis will depend first on its cause. If the disease has resulted from an acute attack or from syphilis, the local treatment may be very much the same for each. The acute exacerbations, whether from spasm or renewed œdema, should be treated by the inhalation of steam in which carbolic acid is atomised, and by the employment of hot flannels to the neck, which should also be irritated by some turpentine liniment. If these measures be

of no avail, a leech or two may be applied to the skin over the larynx or manubrium. Some practitioners employ ice-cold compresses to the front of the neck, and these are frequently changed. Tracheotomy may be required for the relief of the child in the acute attacks. It may also be performed in the severe cases of much thickening of the laryngeal tissues as a remedial measure, thereby relieving all anxiety of the sudden attacks of suffocation, and enabling local treatment to be most efficiently applied to the diseased tissues. In the adult local treatment of the laryngeal disease is comparatively easy to carry out; but in children, owing largely to the smallness of the passages leading to the larynx, the difficulty of applying remedies locally to the larynx, as well as of diagnosing the nature and the extent of its morbid conditions by the use of the laryngoscope, are not unfrequently insuperable. (See Chronic Sore Throat.)

The constitutional treatment is of the greatest importance, and comprises the careful regulation of the diet, the avoidance of close rooms by keeping the patient out in the sea air as long as possible. The administration of cod-liver oil and syrup of iodide of iron, as for scrofula (p. 63), is most useful. In the laryngitis of congenital syphilis during the first months of life mercury is decidedly required, but in the chronic conditions that remain after the first two years of life have been passed I believe that mercury, not iodides, is of but little value, and the more general means of strengthening the constitution are of the first moment, as, indeed, they are in the treatment of syphilis of no matter what age or in what constitution. The best way to employ the mercury in congenital syphilis, when the larynx is the most anxious seat of mischief, is to keep the blue ointment in contact with the skin of the front of the neck, and to rub it into this part. The lanoline preparation is most effectual.

Anæmia may cause chronic hoarseness in children as the

effect of weakness of the adductors of the glottis. The cure of the anæmia causes the aphonia to disappear (G. V. Poore). Sometimes aphonia is hysterical in origin even in boys.

Growths in the larynx.—Warty growths—true papillomata—occur in the larynx of children a few years of age.

The symptoms that they produce are those of chronic disease of the larynx. The voice is reduced to the condition of a low whisper in marked cases, and dyspnœa of chronic kind, with recession of the chest walls, and with a liability to the development of acute attacks of suffocative character, are the symptoms in severe cases.

In the early stage the symptoms amount to alteration of the voice, which may be merely hoarse, and to occasional attacks of stridor with the signs of imperfect entry of air into the lungs.

Treatment is as difficult as, if not more so than diagnosis. Chromic acid may be brought into contact with them. Some prefer this to the galvano-cautery. Occasionally in children they may be seized with forceps, and torn away. But usually all these things are done in the dark. Swabbing the throat and larynx with a four per cent. cocaine solution may enable something to be done. I believe that *tracheotomy* should be performed, with a view to enabling the larynx to be thoroughly treated. *Thyrotomy* should be practised, and the growths attacked *in situ*. The galvano-cautery is perhaps the best, after the larger growths have been cut away. Some prefer chromic acid; others salicylic paste made of the acid and glycerine. The tendency for these papillomata to recur has to be borne in mind. Tracheotomy may have to be done for a sudden paroxysm of dyspnœa.

RETRO-PHARYNGEAL, RETRO-ŒSOPHAGEAL AND PERI-LARYNGEAL ABSCESS.

Retro-pharyngeal abscess is an important affection, and specially dangerous in infants under the age of one year,

for these abscesses are frequent at this period of life, and their diagnosis sometimes presents difficulty.

The *causes* are not always known. Most of the abscesses are "idiopathic." Some result from acute specific fevers; others from disease of the cervical spine. A few have been attributed to injury. The *symptoms* are usually characteristic: dyspnœa, dysphagia, and a peculiar stridor during inspiration, and maybe also during expiration; sometimes the stridor has a croupy quality. The symptoms of obstruction to the entry of air into the lungs are usually more marked when the child is in the recumbent posture. The dyspnœa is frequently of a paroxysmal nature. I saw one infant aged five months in whom the symptoms were of long duration: she was perfectly hoarse for three months, had much muco-pus in the fauces, with considerable recession of the lower parts of the chest walls and supra-sternal fossæ. She died rather suddenly. The parents refused tracheotomy. I could not detect the abscess with my finger passed into the throat as far as possible. A necropsy made with Dr. Oldman, of Bletchingley, revealed a chronic abscess containing thick greenish pus, situated behind the œsophagus. There was no other sign of disease in the body, and certainly no cervical caries.

Retraction of the head has been observed, but this is probably to be set down either to the presence of bone disease or to acute swelling of lymphatic glands at the back of the neck.

The swelling caused by the abscess may usually be detected by the finger passed into the pharynx. It may also be seen bulging the posterior wall of the pharynx, and may cause a swelling in the side of the neck. Displacement of the larynx has been observed.

Sometimes the abscess bursts spontaneously, and the matter may then be swallowed or ejected by the mouth or nostrils.

All the symptoms of this form of abscess may be caused by solid exudation in the retro-pharyngeal region.

The **treatment** is simple and usually efficacious: a guarded bistoury passed into the swelling from the mouth. The abscess may also be emptied, when the way seems clear by aspiration through the skin of the neck. Suppuration may occur outside the larynx in other situations than retro-pharyngeal, but there is no need to separate these from the latter, inasmuch as the symptoms are practically the same, though the abscess may be easier or more difficult of detection. If the abscess be visible or palpable it should be treated as any abscess by hot fomentations and poultices. An exploring syringe may be used in the diagnosis. The treatment should be tracheotomy unless the abscess can be opened and pressure removed from the air and food passages. Not unfrequently the child's strength is greatly lowered as the result of previous disease, and from the dyspnœa and dysphagia. Hence stimulants and nourishing food will be required—brandy, eggs, beef tea, meat juice, mutton broth, Mellin's food. It rarely happens that the dysphagia is so great as to require the naso-gastric catheter. The rectum may be made use of to administer peptone suppositories and the like should prostration be great.

BRONCHITIS.

Infants and children, especially feeble and rickety ones, are prone to take bronchitis. Children with heart and lung disease are also remarkably liable. Of its occurrence in measles, typhoid fever, hooping cough and other fevers all are aware. The symptoms and physical signs are the same as in adults—the provisoes made in the introductory chapter on this section being taken into account.

The special tendency for bronchitis in children to lead to overburdening of the right ventricle, with its possible con-

sequences of asphyxia, coma, and convulsions, should ever be borne in mind. This danger is greater the more extensive the bronchitis, and the more it affects the smaller tubes. The likelihood of broncho-pneumonia and collapse setting in, with or without warning, will naturally be remembered. There are no means, that I know, of diagnosing **capillary bronchitis** from disseminated broncho-pneumonia. In both these diseases fever is high, the venous system full, the pulse respiration ratio disturbed, the rhythm of respiration altered, pulse feeble, skin pale, sweating and livid. Physical signs give no special aid unless the consolidation is sufficient to cause dulness and tubular breathing. Increasing asphyxia and engorgement of the right ventricle is attended with feeble shallow breathing, loss of voice, ineffectual cough, mental apathy and muscular twitchings. **Chronic bronchitis** occurs in weak strumous children, or may be left after measles or whooping cough. Beyond preventing full and perfect growth of the body, and leading more easily to chest deformities, spinal curvatures, and finger clubbing, I do not think there are any remarkable differences between the chronic bronchitis of children and that of adults. The *hygiology*, or science of the preservation of health of childhood is of vast importance in the treatment of bronchitis. A cold and wet atmosphere, especially if a constant climatic condition—including as it generally does sudden variations in the temperature, barometric pressure, and electrical phenomena—is the best friend to the bronchitis, and perhaps the worst enemy to the child, or indeed adult. The child is, however, the better measurer of hygiene or *hygiometer*. Accurate adaptation of clothing to the whole surface of the body, avoidance of the causes of chill, of overcrowded rooms or impure atmosphere—so oft repeated—cannot be passed over here without still further recital. I do not advise special chest protectors, but if they have been worn it is not advisable

to remove them in cold or changeable weather. After a time they become saturated with the emanations from the body, and must be regarded as filthy foci—germ growing and parasite promoting—and therefore needing disinfection or burning altogether. A carefully made woollen undergarment is the best chest protector.

For the general treatment of capillary bronchitis I must ask the reader to refer to the instructions given under catarrhal pneumonia.

Treatment of bronchitis according to state of cough and secretion.—Stimulant expectorants should be avoided when the cough is hard and the secretion *nil.* Usually increased congestion is attended with increased secretion, but in bronchitis (as in the first stage of catarrhs generally) there may be intense hyperæmia with dryness of surface, just as happens in the physiological action of atropine. May there not be an alkaloid like atropine at work in many an ordinary inflammation? Stimulant expectorants as a rule raise blood pressure and diminish secretion. When the secretion is scanty and viscid, and with difficulty coughed into the pharynx, alkalies are valuable; as also are expectorants like ipecacuanha, lobelia, and iodides. All these agents increase the fluidity and the amount of the bronchial secretions. The value of the bronchitis kettle also consists in its supplying warmth and moisture to the inspired air, which tends to promote secretion from dry and congested surfaces. Sometimes the cough becomes hard and secretion scanty only for a few hours at a time; the steam inhalation may then be used intermittently. Draughts of cold air playing on the neck and chest raise blood-pressure and diminish secretion, probably by reflex vasomotor action. Cold air, also, acting directly on the dry, congested bronchial surface, would tend still further to diminish secretion and maintain a hard cough. These are the reasons for keeping the child in bed under a tent with the neck and chest carefully clothed. For the same

physiological reasons we confine a child with bronchitis to one room, and thus the irritation to the skin and bronchial mucous membranes which may result from the atmosphere of halls, passages, and unused chambers, is avoided. The air of these apartments is hygienically as deleterious as that outdoors, and perhaps worse, because stagnant and likely to contain more dust and noxious emanations from carpets and furniture. Such instructions are all the more necessary for febrile children whose resistance to the usual conditions of the environment is lowered. The necessity for perfect rest in bed, implying the least possible expenditure of force, is thus physiologically explained.

℞ Liquor Potassæ, ♏v., or Potas. Cit., gr. iii.
Spt. Æth. Nitr., ♏x.
Aq. Camph., ʒii. t.d.s.

for a child two years old.

Vini Ipecac., ♏v., may be added, or Tinct. Lobeliæ Æth., ♏v., especially if there be spasmodic obstruction. The sodium or potassium iodides may be prescribed in two-grain doses to a child of the same age.

Counter-irritation by means of poultices and embrocations are most valuable, also, in influencing the cough and secretion. They have the property of modifying the mucous membrane in opposite directions. If the cough be hard they loosen it, and conversely, when secretion is free, they often act as tonics to the congested vessels, bracing them, raising arterial pressure and diminishing secretion. A thin jacket poultice of linseed meal with mustard (16 parts to 1) is an excellent stimulant to the respiratory centres, and influences as above indicated, the condition of the mucous membrane. The mustard may remain on for an hour, the skin being guarded as usual by a thin layer of muslin or linen. A fresh simple poultice should then be prepared, if the effect has not been sufficient. Some prefer repeated sinapisms. Small areas of the surface of the chest are then irritated successively by

stronger mustard applications, that remain on a few minutes in each place. After the removal of the poultices the skin should be smeared lightly over with sweet oil, and the chest covered with a layer or jacket of cotton wool, so as to keep the surface at a uniform and warm temperature.

When the secretions become profuse and the cough loose then is the time for stimulant expectorants.

℞ Ammon. Carb., gr. ii.
Vini Ipecac., ℥v.
Aq. Camph., ʒii. t.d.s.

or ℞ Ammon. Carb., gr. ii.
Tinct. Nucis Vom., ℥ii.
Inf. Senegæ, ʒii. t.d.s.

for a child two years old.

Kobert says senega owes its expectorant power to two glucosides which are also contained in Quillaja saponaria, an infusion or tincture of which has been used by Goldschmidt successfully as a palatable substitute for senega in children.

Turpentine or terebene inhalations also act as stimulants and tend to lessen secretion. They may be prescribed internally in syrup, honey, or sugar, or in the Mist. Amygdal Co., or best in little capsules. Two-drop doses will be suitable for a child of two, repeated three or four times a day.*

Drinking linseed tea, or thin barley water flavoured with lemon essence, relieves a hard cough and promotes sweating and diuresis. There is less need for these drinks when the secretion becomes free.

The *morbid sensations* in the chest, and the unhappiness due to the influence of the complaint on the cerebral cortex, are relieved by the above-mentioned expectorant, counter-irritant, and demulcent agents. The distress of children in bronchitis is a most important item for treatment.

* For other remedies to check excessive secretion see Chronic Bronchitis and Dilated Bronchi.

The *dieting* and *internal stimulation*, and other measures necessary in **capillary** bronchitis, are carried out on the same principles as those recommended in catarrhal pneumonia.

When the smaller tubes are loaded with secretions, and but little air is entering, the case is desperate, and the practitioner is placed between cross fires. An emetic is the proper remedy for unloading the tubes, but the patient's vitality may be reduced to the lowest ebb. Undoubtedly free stimulation with brandy, whisky, or champagne in dram doses frequently repeated would be urgently needed. And though the emetic must prostrate somewhat, yet it should be given combined with free stimulation. Profuse secretion gurgling in the tubes may be attended with sleepiness and drowsiness. Opiates must not be used, lest this tendency to coma and bronchial paralysis be increased. Opiates diminish secretion, but paralyse the respiratory neuro-muscular apparatus, and thus lead to further clogging of the tubes.

Cough should be encouraged if the child is old enough, and an emetic is very good treatment under such circumstances, for it not only rouses the respiratory centres and removes mental apathy, but helps to throw the secretions out of the tubes.

Emetics, indeed, are valuable in most cases of bronchitis. All doctors are agreed that sweating tends to relieve the congestion of bronchial mucous membranes. Sweating may be regarded as a sedative expectorant and derivative. Liquor ammoniæ acetatis in half-dram doses may be used alone or in combination with the hot air bath. Like emetics or nauseants they depress the circulation, moisten the skin, and increase secretion from congested tubes. Antimony, aconite, and ipecacuanha have a similar action; but the two former are too powerful for general use in children, and the depressant action on the heart is not a desirable effect in itself.

Purgatives.—Free purging, except once at the outset, is to be

avoided. It is the usual thing to give a calomel and scammony or jalap purge at the onset of bronchitis, as of most acute febrile diseases in children, when the tongue is loaded, the skin sallow, and the bowels confined. Afterwards mild laxatives may be employed—fluid magnesia, castor oil, compound liquorice powder, if the bowels are not opened.

Cough may be relieved by the circumstances and conditions previously mentioned. If these be insufficient to allay it, and the distress and attendant exhaustion, the doctor must examine carefully the state of the nose, throat, and other parts of the body, for conditions outside the bronchial apparatus may be chief causes of cough. Besides turpentine and terebene, compound tincture of benzoin or carbolic acid may be used as an inhalation to check secretion and diminish cough. The throat may be the "trigger area" of the cough, and when this is the case mopping or gargling the throat with an astringent preparation, or with a four-per-cent. solution of cocaine hydrochlorate, will often prove effectual.

Convalescence requires the usual precautions against the internal and external environment—attention to bowels, diet, digestion and avoidance of cold, damp, nocturnal or impure air, &c. A change of air to a seaside place, or to some high and dry inland health resort, is advisable. The climate to be chosen should be selected according to the state of the secretions and of the vitality of the child. Dry and bracing suits most cases, but the cold may be too much for some children.

The cerebral cortex requires treatment. Misery increases bronchitis; happiness increases health and lessens bronchitis. A little alcohol may promote happiness, which may provisionally be regarded as cerebral hyperæmia. A new toy or other fascination, provided the digestion be good, will also promote the health of the cerebral cortex. Bright scenes, cheerful attendants—but those who exact obedience—are valuable adjuncts to other treatment.

To get rid of bronchitis, nothing is worse than allowing the child to trot about. Warmth and protection of surface by rest in bed is far the best way of preventing an acute attack becoming chronic.

Infants are not to be nursed more than is absolutely necessary. Rest in the cot is the best way of eking out the breath and strength, which are taxed by nursing and movement. A child not ill may sit up in bed with an extra flannel jacket on, but resting on a couple of well appointed pillows.

Drugwise, *slight cases* require nothing but a febrifuge and expectorant:—

℞ Pot. Cit., gr. ii.
V. Ipecac., ℥v.
Syr. Tolu, ℥x.
Aq. ʒii. t.d.s.

for a child two years old.

Absence of fever indicates removal of the citrate from this mixture.

Antimony in this article is adequately represented by its absence. Some authors still use it—none I think, and verily hope, in infants under one year. Uncertain in its action in different individuals, there are few cases—and I have never seen one, at any period of childhood—in which it is preferable to less powerful paralysants of the myocardium and circulation.

Bleeding after the Sangrado fashion is dead for ever. Dry cupping and leeching still live a lingering and somewhat lonely existence. Again in infancy I must altogether deny their need. Hot baths and local applications, or even ice bags, will generally suffice for all requirements where the above agents are indicated. Blisters are also not advisable to such delicate skins. *Calomel* in repeated doses is condemned.

Rickets, tubercle, or scrofula should be managed as directed elsewhere.

In **chronic bronchitis** hygiology is the most important

question, or rather series of questions. A child compelled to live in a city or town should wear an oronasal respirator to filter and warm all the inspired air; this must be insisted on in bad weather. The respirator is not worn indoors; but that is not because the air inside a house is any less dirty than the circumambient atmosphere. Respirators must be disinfected by being placed in a very hot stove every day.

Warm flannel or woollen clothing is of vital importance. The maintenance of the circulation in the limbs by these means, and by exercise (or gymnastics) in the fine weather outdoors, and in open spaces is equally to be enjoined. In fact, children suffering from chronic bronchitis should be treated like the scrofulous (see p. 59 et seq.).

Cough and râles are not always present; but almost any exciting cause, either in the child's internal or external environment, will be sufficient to bring back both cough and secretion if they are absent. Dyspnœa and emphysema may always be present, and are equally influenced by changes in the internal or external environment. The necessity for attending to hygiene, diet, digestion, and defæcation cannot therefore be overrated. There may be a demand for repeated respiratory stimulants when the dyspnœa is more or less constant. A little alcohol with the meals is not the least useful stimulant to breathing as to digestion. Small doses of digitalis may be given intermittently when the pulse and circulation appear to be feeble and to increase the dyspnœa chiefly due to other causes. The fresh infusion is best in half-dram doses given as long and as frequently to a child of seven as may be necessary. Squills and nux vomica, with carbonate of ammonia, are other cardiac tonics.

The habits of life must be perfectly regular. Not even a minute expenditure of unnecessary force should be entailed either by unsuitable food or disagreeable mental or bodily work. Deprivation of sleep and undue excitement with

violent games, scolding, terrifying, and the like, are most injurious. They upset not only the nervous balance, but the cardiac compensation.

I have known acute attacks to supervene simply apparently as the result of undue expenditure of nervous energy from the romping and excitement attendant on a birthday festival. Doubtless the heart becomes over-taxed in such circumstances. But even when every precaution is taken to prevent the room from becoming overcrowded, and the child from going into the cold passage or hall, and from committing indiscretions in diet, such entertainments often prove the exciting cause of a fresh attack of bronchitis in these hyperæsthetic and sickly ones.

If there be anæmia iron should be prescribed in that form most suitable to the state of the stomach. The bowels must be evacuated daily, or the iron will do no good. Cod-liver oil as directed under scrofula is of immense importance.

Chloride of ammonium in five-grain doses three times a day will tend to check excessive secretion, and cod-liver oil has a similar action. These two remedies might be prescribed together. Many other stimulants and antiseptics are used to lessen expectoration or its equivalent. Balsam of copaiba with liq. potassæ, of each five minims, with ten drops of sweet spirits of nitre in two drams of camphor water, is a convenient prescription. If the secretions be very viscid and hard to eject, alkalies and expectorants of the sedative type are indicated. Bicarbonate of soda, wine of ipecacuanha, liquor potassæ are useful, and may be given in a stomachic infusion of gentian or calumba. For further treatment see Bronchi-ectasis.

The importance of long residence in a suitable *climate* for cases of chronic bronchitis cannot be over-estimated. Where the bronchitis is associated with bronchial asthma Bournemouth, which is warm, but not relaxing, except in the hot

months, will suit a large majority of cases; others do better at mountain stations. These are cases where the secretion tends to be excessive, and the child thin and neurotic rather than strumous and stumpy. The majority of chronic bronchitics are of the short and stunted kind. A sea coast at a moderate elevation is the most suitable; the Riviera, Canary Islands, and Algiers are some of the most in vogue. Caution should be given in sending the child away that cold and damp days should be passed indoors, with the necessary regulations as to ventilation and warming of the apartments.

BRONCHO-PNEUMONIA.

Broncho-pneumonia, or catarrhal pneumonia, illustrates some of the canons of infantile pathology perhaps better than any other serious disease of childhood. Our hereditary enemies, low temperature and humidity, always act at an advantage in the causation of disease when the subject is an infant. This and the tendency for disease to spread is well illustrated in broncho-pneumonia. If the protoplasm, as a whole, or the general constitution be brought below par by any disturbance of normal functions or by any disease, the tendency for bronchitis to involve the alveoli of the lung becomes exceedingly great.

The contrast between lobar and lobular pneumonia is highly instructive.

In both there is marked *depression of vitality*, but this arises in lobar pneumonia as the result of neuromuscular prostration, whereas in broncho-pneumonia it is due to overloading of the right side of the heart, and to engorgement of the lung circulation. Lobular pneumonia usually begins insidiously, supervening on bronchitis as in measles, whooping cough, diphtheria, and rickets. The rise in temperature may be sudden and great, but the arterial circulation is not full and bounding, but rather empty in a typical case, whilst

the venous system is full, and the surface of the body tends to be cold, clammy and wet, rather than hot, pungent and dry. The course of the pyrexia in the secondary disease (broncho-pneumonia) is very irregular, and its termination is almost always gradual and slow. The duration, too, is usually twice as long, and may be many times longer than lobar pneumonia.

The tendency is towards death *from asthenia through asphyxia*, and not directly from cardiac or neurosal weakness as in lobar pneumonia.

The disease is very common during the first two years of life, and thus again contrasts with lobar pneumonia.

The *onset* of broncho-pneumonia is usually known by sudden rise in temperature, sudden alteration in the character of the cough, which, from being loose and paroxysmal, becomes short, sharp, hacking and evidently painful. (Like that in croupous pneumonia and pleurisy, this cough is very likely a reflex from irritation of the pleural serous surface.) The respirations (may be of "expiratory" character) become hurried, and the child shows that it feels the want of breath by *sitting up in bed and struggling*. Lobar pneumonia, as a rule, does not cause sensations of want of breath, for the child lies in the horizontal position without distress. The struggle for breath is evidenced physically by recession of the soft parts of the chest walls, and by overaction of the costal and cervical muscles. Great engorgement of the right heart makes the body surface marble-white, with leaden-hued lips and dusky matrices of nails. The anterior nares work intensely in both forms of pneumonia. Corresponding with increasing burdening and paralysis of the right heart, the *voice and cough become feeble* almost to suppression, and the ejectment of bronchial secretions into the pharyngeal cavity a sheer impossibility.

In this state the coma of asphyxia with its *death-like*

apathy passes into real death with attendant apnœal convulsions, which had long been brewing, as the twitchings in the limbs, face, and eyes showed.

Lobar pneumonia tends to get well, and when death occurs it is frequently unexpected, but in lobular pneumonia the frequent fatal termination gives increasing and deepening warnings of its occurrence in the labouring and struggling of the lungs and heart.

The *physical signs* may be those of scattered dulness, chiefly at the bases of both lungs, and often over the middle lobe of the right lung, which is prone to collapse and inflame; the breathing may be tubular, but is usually less typical than in the lobar consolidation. There are more adventitious sounds, and crepitations are generally heard all through the course of the solidification. Increased vocal resonance may be present, or there may be a diminution. Dilatation of bronchi or dense solidification, the tubes not being completely choked, give a metallic character to the breath sounds and to the râles.

The only point of importance in the differential diagnosis is the question whether *tubercles* are present or not. This will have to be determined by the family history and by the progress of the case. If the child be some years old the long continuance of the signs and symptoms of catarrhal pneumonia is favourable to the diagnosis of tubercle.

The **treatment** of broncho-pneumonia will tax the resources of the best nurses and doctors. The principles are simply those of supporting the strength of the heart, and using every means to increase the powers of inspiration and expiration. *Cardiac and respiratory stimulants*, therefore, take a first place in the treatment; but all measures that prevent loss of general strength will act at the same time as heart and lung stimulants.

Prophylaxis.—The affection is one that indicates general

debility, and our object in tending infants with simple influenza, diphtheria, measles, and whooping cough should be to ward off debility. Hence any catarrh should be treated carefully (see p. 145). Moreover, intestinal and gastric catarrhs should be promptly relieved.

Hygiene.—The sanitary arrangements and personal hygiene are of lasting importance. But suppose the broncho-pneumonia to have developed in spite of every attention, then the child, being in a tent bed with a warm, moist atmosphere in a large airy, but draughtless room, he may be further treated as follows in a typical case:—

The *dietary* should be sketched out, food being given in small doses every hour:—Milk and barley water; mutton broth thickened with Mellin's food; strong beef tea and meat gravy.

Stimulants.—Then brandy or liquor ammonia should be given in milk regularly in doses of ten minims, repeated as often as necessary. This diet and stimulants form part of the general stimulation of the whole system, but there are other powerful means of effecting the same, which also, it should be borne in mind, strengthen both circulation and respiration.

Cyanosis.—Any increase in the weakness of the pulse, in the skin sweating, or in the whiteness and lividity of the surface, should be promptly met by the *hot bath*, in which *mustard* should be strewn:—Two tablespoonfuls of mustard in two gallons of water for a child two years old. This stings the skin all over, and increases the depth of inspiration partly by its direct reflex effect, but partly, also, by making the child cry. It also *arouses the cerebral centres* and removes the apathy already referred to. These *baths* may be continued for a few minutes, and repeated if necessary.

Is *bleeding* ever legitimate in overloaded right heart in young infants with broncho-pneumonia? It is true we relieve

the loaded veins for the time. But the cause of the overloading remains. True, we may gain time by bleeding, and we may arouse the child from its apathy. But the bleeding may kill by increasing the weakness. Any case must be considered on its own merits which require careful and deliberate weighing. In most cases I should trust to hot mustard baths and free stimulation.

Pyrexia.—Sometimes it is the high pyrexia that is weakening the arterial circulation and lung movement. Then we have in the *cold* bath, the cold sponging and the wet pack, valuable therapeutic agencies. The capillary head tubing (Thornton's) may be used alone. The water trickling slowly through the capillary tubes effects considerable reduction of temperature, and often makes the child brighten up and cry, both of which are good for the heart and lungs. If the cold bath be used, the water should be gradually lowered to a temperature of 65° F. The child may have an extra dose of brandy before going in and on being taken out of the bath, in which he may remain five or ten minutes, the thermometer, if possible, being almost continuously in the rectum to afford indications. The surface of the body is often cold and blue, whilst the internal temperature is high. When the child comes out the surface of the body should be thoroughly rubbed dry, and hot bottles may be used near the feet. It may sound contradictory, but I have had another hot bath with mustard put by the side of the cold bath, and have given the child's skin a taste of this for a few seconds after effecting some change in the temperature by the cold bath. It is well known that the temperature goes on falling for half-an-hour or so after the patient is removed from the bath ; and that the first effect of a hot bath, by dilating the cutaneous vessels and presenting a larger surface of blood to the cooling effect of radiation, is to lower temperature.

Thermometer.—The temperature of the body should be

taken every three or four hours, and the bath repeated as soon as it gets to, say, 103° and remains there. Some physicians resolve on keeping the temperature below 101°.

Now if the fever be not higher than 102° we can get all the reduction that is necessary by the use of *damp cloths* or *tepid sponging*. The wet pack may be used as in fevers. When the prostration is extreme the water bath at a temperature of 65 to 70° F. should not be used. The milder measures should be preferred.

Local applications.—*Stimulating.*—But if there be no alarming increase in the heart or lung debility, we may content ourselves with such stimulation as may be gained by the use of poultices and other hot fomentations and irritating liniments. The majority of cases that occur in measles, diphtheria, and hooping cough, are treated by these chest and throat counter-irritations. A light jacket linseed poultice, on the surface of which a little powdered mustard is lightly dusted with a castor, will prove a most comforting and thorough stimulant to the heart and lungs. The skin must be protected from the mustard by a thin layer of linen or muslin. Care should be taken to wrap the chest up in cotton wool on the removal of each poultice, which should not remain longer than two hours. Poultices are not always required. Sufficient stimulation to the breathing and the heart may be effected by turpentine or chloroform liniment. The skin should be thoroughly reddened and kept so. It is of no consequence even if *blistering* result in places, but in girls of the well-to-do this should be avoided, for cosmetic reasons, as the blistered surface may become permanently pigmented. Whether the *stimulation* be applied *externally* or *internally*, the effect is judged by the improvement in the pulse and by the increased depth and lessened frequency of inspiration.

Emetics.—Both these effects are also brought about by the use of emetics, which are valuable chiefly in the first day or

two of the new fever and altered breathing and cough. Half-a-grain of sulphate of copper in a teaspoonful of water every ten minutes is the best mode of causing emesis, though I have more generally used dram doses of ipecac. wine every fifteen minutes.

Internal remedies.—*Stimulant and depressant expectorants.*—I always prescribe carbonate of ammonia gr. ii., V. ipecac. ɱv., infusion of senega two drams for a child two years old, every four hours when the cough is *loose.* But if the cough be *hard*, and *secretion slight*, then—

℞ Liq. Am. Acet., ɱxv.
V. Ipecac., ɱv.
Spt. Æth. Nit., ɱv.
Aq. Camph., ʒii.

every four hours.

The *feeding* of the case, when the infant is collapsing and comatose, is to be done by the *nasal* tube passed into the stomach; and a *peptone suppository* may be introduced into the rectum every few hours if there be no diarrhœa.

Diarrhœa is sometimes very troublesome and reduces strength visibly. But opium should never be used when the lung trouble is urgent. It paralyzes the respiratory centres and dries up secretions, whilst increasing the tendency to or actually deepening the narcosis of the complaint.

Tonics.—When the disease is prolonged for several weeks, iron and quinine are valuable tonics.

℞ Tinct. Quinæ Ammoniata, ʒi.
Ferri et Amm. Cit., gr. ii.
Glycerine, ɱxx.
Aq., ʒii.

be given three times a day.

Convalescence.—As soon as convalescence is established, child should be taken to a seaside place, care being taken et him have plenty of fresh air, and at the same time to

be so clad as to his belly, chest, and head that no more catarrhs be excited.

Local antiphlogistics.—General bleeding, purging, and mercurialization are gone out of fashion. We have not yet done with local bleeding in the form of leeches. Ice bladders and cold wet compresses well rung out are also applied to the chest, and sometimes with apparent great success.

The ice bladder doubtless exercises a general anti-pyretic effect, but treatment by it can only be considered as on its trial. I have tried it successfully in two cases in infants under twelve months.

COLLAPSE OF LUNG.

The symptoms, causes, prognosis, and treatment of collapse of the lung present but little differences from those of atelectasis. There are all degrees in the symptoms, proportionate to the amount of obstruction to the flow of blood through the lungs, and to the amount of solid lung tissue.

Collapse is the result of bronchial catarrh or obstruction in the tubes of any kind, plus deficient vitality in which the neuro-muscular respiratory apparatus participates. Any catarrh, whether simple or from measles and hooping cough, may be its cause, but the feeble vitality (rickets) has fully as much to say in the causation as the catarrh. Consider also the statements made at the introduction of the section on respiratory diseases.

In the *diagnosis* of collapse or atelectasis from other pulmonary consolidations, an important point is the *lowness* of the body temperature, which is not above the normal, and is usually below it, even in the rectum. This serves to distinguish it from capillary bronchitis and catarrhal and lobar pneumonia. Roughly speaking, the percussion and auscultation are pretty much alike in the inflammatory and collapse consolidations. Typical cases of lobular and lobar pneumonia

and collapse of lungs may be differentially diagnosed. Physical examination, and even the history, *may*, however, leave us in doubt.

The essence and cause of collapse and atelectasis is weakness of respiratory movements. There is not that labouring and struggling of respiration as in catarrhal pneumonia. If the muscles would only work efficiently, the collapse would not increase, and recovery would soon ensue. It is not that the muscles are overtaxed, but that they are not properly innervated. In other words, the nerve centres are not energized enough.

All **treatment** may be focussed to the principle of stimulation. There is the respiratory neuro-muscular apparatus. It has to be got to work as thoroughly as possible. Now the medullary centre may be filliped by mustard baths to the whole body ; it may be strengthened by the administration of brandy and ammonia ; it may be kept working by voluntary effort in those who possess a will. Torpor of the infant, and especially of the infant whose lungs are partly solid, aids in the maintenance of the feeble respiratory power. Of great value are :—*Emetics*—as in the congenital form : turpentine and ammoniacal embrocations and even inversion of the infant so as to keep plenty of blood at the head. These measures, directly or indirectly, arouse the respiratory nervous centres. For other treatment see the congenital form and the paragraph on asphyxia neonatorum. A knowing child should be instructed in voluntary efforts at deep inspiration. Crying is a good sign of improvement, and will further improve the respiratory powers. Our focus still in view—great is the necessity for keeping the air warm, but fresh and free from all impurity, for maintaining the corporeal surface at a constant adequate temperature, and for stimulating the body by efficient nourishment and stimulants. Cold devitalizes the body and respiratory centre and may excite more catarrh and collapse. Defective feeding allows the

respiratory centres nothing to energize themselves with, and so also if oxygen be excluded.

PHTHISIS.

Remembering the canons of children's physiopathology, there is but little in the various forms and degrees of their phthisis that requires a separate description. Their proneness to catarrhs; to the spread of disease in general; the ease with which their vitality is depressed by sudden onsets of disease; their remarkable powers of recuperation, endurance of febrile body-heat; their difficulty of expectoration, or rather hawking; the unreliability of percussion and auscultation as indicating pulmonary lesions—these are the factors that modify their phthisis, and often render diagnosis more difficult—especially diagnosis of details—than obtains in the adult. Though cavities may be rarer in infancy than adults, of which I have doubts, yet there is no lesion and no symptom, or none that I can think of, which may not occur in the phthisis of infancy and childhood.

The *diagnosis* of acute phthisis may have to be made from croupous and catarrhal pneumonia, severe bronchitis, typhoid fever, and acute general tuberculosis. The greater severity and onward progress of the general symptoms (emaciation, fever, anæmia, sweating, weakness), the physical signs of rapidly forming cavities, and the detection of areolæ of elastic tissue and bacilli—in the sputa wiped if necessary from the base of the tongue—are the most important features. Consult also the sections on the other diseases.

The *diagnosis* of chronic phthisis is often difficult owing to the ease with which children bear chronic disease generally without showing much emaciation, anæmia or asthenia. Empyema, prolonged catarrhal pneumonia, mere debility with catarrhal signs in the chest, bronchi-ectasis with fibroid

lung, are the other maladies most to consider and differentiate from chronic phthisis; indeed, the second and fourth are practically indistinguishable from many cases which the necropsy shows to be tubercular disease or simple fibrosis in which the liver and kidneys may have participated. Not even the tendency for catarrhal pneumonia to pass away can be regarded as its sole prerogative, for actual tubercle is not without at least an occasional favourable termination, especially in the child. Areolæ of elastic tissue and tubercle bacilli may afford help in the differential diagnosis, but authorities are divided as to whether fibrosis has a bacillary accompaniment. For the diagnosis of empyema see what has been written further on.

The **treatment** of phthisis demands division into divers departments.

The doctor must drain the resources of *hygiology* or the science of the preservation of health, and for individuals born at a disadvantage in the struggle for existence. The child who may become tubercular or phthisical, is often the offspring of tubercular parents or ancestors. The tubercle may appear before the first set of teeth have appeared, but generally after this period, or two years of age. If there be anything in the idea of contagiousness of tubercle, the necessity for the child not being brought up by phthisical people or in phthisical surroundings is emphasized. The mother, if delicate or phthisical, should not suckle her infant. A healthy wet nurse is every way to be preferred—partly because the human milk will be the best to prevent any tendency to catarrh of the intestines, which is sure to be associated with catarrh elsewhere and sequent debility or debility may come first and catarrhs later; and partly because, if cow's or other milk be used, there is a liability to contamination of it with tubercle (bovine tuberculosis), as well as the likelihood of its not agreeing with the infant. Moreover, all

artificial foods must be exposed to the atmosphere, and thus there is risk that the dust with germs innumerable may form part of the infant's ingesta. From these considerations the corollary is drawn that *pure atmosphere* is more than ever a necessity. Hence the dwelling of tubercular children should be not in large towns or cities, but in dry, elevated country places free from sanitary defects. I might dilate on the inevitable depression of vitality and on the injury to the mucous membrane of the respiratory passages that cannot fail to arise as the result of exposure to emanations from decaying organic matter, such as always abounds in thickly-populated parts; I might speak of the deleterious effects of dampness and malarial poisons, of sewer gas and of an atmosphere rich in carbonic acid and organic emanations from human and animal beings, not to mention carbonaceous particles and bacilli; but if the necessity for the attainment of the most perfect hygiene possible be realized, the space needed for such an exposition need not be occupied. Again, the indispensableness of warding off hooping cough, measles, and typhoid fever is another cogent argument for the avoidance of towns and cities; for it is, we hope, true that these diseases are the appanage, as a rule, of large populations and their consequences. It is not good for tubercular children to enter for children's complaints; it is good for them to "get over" them, which they often fail to do; but it is far better that they should never have them, or should wait till they reach adult age, when they may be better able to cope with them. What has been said elsewhere as to ventilation during sleep and waking, to clothing, exercise in the open air, and the regulation of the diet with attention to the appetite and bowels, and the avoidance of every possible mental, nervous, or physical agent or agency of depression of vitality, applies with the strongest emphasis here.

The nutrition of *nerve and muscle*, and especially of

respiratory nerve and muscle, should be maintained at any cost by the obtaining of sufficient sleep and enough exercise, by regulation of diet, so that both sleep and exercise may be possible, and by the prevention of catarrh of the respiratory organs. Everything works wheel within wheel. Improvement of one organ improves others; derangement of one deranges others.

Is it necessary to say that long, narrow chests with small lungs are not the only seats of tubercle—that broad thorax and large lung may have it too?

When there is a lesion in the lung the above preventive medicine is equally necessary. But often the diet and appetite require further consideration and careful study. Five grains of bicarbonate of soda and five drops of tincture of nux vomica for a child five years old, with two drams of compound infusion of gentian, may in virtue of its bitter alkaline tonicity give appetite, aid digestion, and strengthen the frame. It should be given before meals to excite the gastric action and secretion. But an acid may answer better. Rationally speaking, this should be taken towards the end of gastric digestion, so as to leave the stomach with the last parts of the chyme and afford a further stimulation to the duodenum.

℞ Acid. Nitric dil., ♏iii.
Liq. Ext. Cinch., ♏iii.
Syr. Aurantii, ♏xxx.
Aq., ʒii. t.d.s.

The *diet* may have to be of the *fancy* description. Nothing is positively interdicted, but excess of sugars and starches should be avoided. Fats are generally disliked, but are good. The food that agrees best, that is to be taken, and no medicaments that cause repugnance or disturb the even course of life should be prescribed. Undoubtedly milk and underdone meat, pounded chicken, cream and new-laid eggs are good if the

child likes them, can be got without trouble to take them, and having got them, can dispose of them to advantage without taxing his liver, kidneys, or brain, and without unduly closing or opening the primæ viæ. A tablespoonful of sound wine should be ordered with the dinner, which should be at mid-day unless the child has an idiosyncrasy and digests better about six p.m. Further stimulation and dieting may be required in acute cases, which are managed on the same lines as typhoid fever, pyrexia being reduced as in other febrile states (see Fevers). Cod-liver oil is the sheet anchor of the special treatment of chronic phthisis; but thought is required in prescribing it. The number of "dodges" that may be devised to get it down are innumerable, but compulsion is against all the laws of infantile therapeutics. Salt on the tongue, orange wine, lemon wine, stout, tasteless oil, almonized oil, biscuits, capsules, and the prescriptions and methods given on p. 63 et seq. Mostly, however, children take it with avidity and digest it surprisingly; but nevertheless the stools should be watched for it, as for casein and unsolved starch. When it cannot be taken as in older children, most frequently inunction is a lost cause. *Maltine* in half-teaspoonful doses, or less to begin with, may be substituted, but it is a most "bilious" article in many thin neurotic children.

Alterative.—Chloride of calcium gr. v. in Extr. glycyrrhiz. gr. xx. and glycerine ℥xx., with water ʒii.

Lactophosphate of lime, hypophosphite of lime or soda, each in three-grain doses for children about five, may be given.

Antiseptic.—Iodoform has been given, but requires caution; begin with a half-grain in pillule, or with sugar of milk. It may cause collapse, delirium, purging, or vomiting, but is often well borne. I cannot say that it has effected much benefit.

All the above medicaments are usually best taken and best assimilated with the meals, and should be given at the ter-

mination of the same. But maltine often agrees far better when given, say two hours after meals, as the last chyme is leaving the stomach. Pepsin in five-grain doses may be prescribed with them if, after all that has been done, the digestion remains weak. It goes best with glycerine and a mineral acid. When the phthisis is very chronic and afebrile, sea-bathing in fine weather, or sea-baths indoors, are even better invigorators than the ordinary baths. They should be carefully ordered, and the effects watched. As with baths generally, so long as proper reaction follows they do good.

Hæmoptysis, which is rarer in children than adults, is an indication for keeping the child at rest, and excitements or reactions of any kind, whether by baths or otherwise, should be shunned.

Small doses of terebene or turpentine ♏v. in syrup or glycerine or in capsule may be prescribed.

Tincture of hamamelis (♏v.) has been tried and Liq. Ext. of Ergot ♏xv. (See also purpura and hæmophily.)

Cough may be relieved by local applications to the throat, by gargles, by sprays, by anti-spasmodics, and by depressant or stimulant expectorants, but none of these means are to be employed indiscriminately. First it is to be ascertained as far as possible the chief cause of the cough, which may be removed by general means, such as dietetic and gastric and intestinal regulations. If the pharynx be relaxed, or adenoid overgrowths be present, these conditions should be attacked by local cleansings with the nasal douche, by moppings with a sponge from the mouth, and by medication; glycerine of tannin, or, better, equal parts of glycerine and strong liquor ferri perchloridi, or the galvanic cautery may be used to the adenoid growths. A simple gargle of chlorate of potash, gr. x. to ℥i. and warmed, or this sprayed on to the throat and larynx, may prove effectual. A little simple linctus of

glycerine ʒss., and paregoric ♏x., for a child three years old may suffice to allay cough. A good dose of bromide of sodium or ammonium (gr. xx.) in syrup may prove effectual. For paroxysmal coughing see the treatment of hooping cough. Mopping the fauces and larynx with a ten-per-cent. solution of cocaine I have found useful in a child 10 years old. Linctus morphiæ, ♏iii. of the hydrochlorate to ʒi. of glycerine, may be given, but must be carefully watched, and should not be used more than is necessary, for it keeps the stools light-coloured and binds the bowels. For other treatment of cough and secretion see "Fibroid lung" and "Bronchitis." The various antiseptic inhalations may be equally useful here as in those affections.

Profuse sweatings are best relieved by liquor atropiæ in drop doses every night for a child three years old. Great care should be taken to keep the linen clean and also to prevent chill when these sweats are present.

Anæmia is prevented by the above general measures and by the administration of iron wine or syrup of the phosphates of iron. I nearly always use the former in gr. iii. doses of ferri et ammon. citratis made up with rectified spirit and water for a child three years old. A dram of the syrup of the phosphates or half-a-dram of the hypophosphites may be prescribed for the same age. Often one's way has to be felt cautiously, and sometimes the initial dose may be as small as five to ten drops. This cautious mode of commencement of drugs is important with iodides, and especially with the syr. ferri iodidi, which are generally voted most commendable for glandular swellings and naso-pulmonary catarrhs. Half-a-dram of the syrup is the most that should be given to a child seven years old. The iodide of sodium (gr. ii.) is preferred, and may be combined with the iodide of iron; the tartrate of iron and potassium goes better with iodide of potassium.

FIBROID LUNG AND DILATED BRONCHI.

Fibroid lung and dilated bronchi occur in childhood as distinguished from infancy, and are due to a very chronic inflammation of the lung, which, like all very chronic inflammations, has the characteristics of a new growth, and chiefly involves the supporting or connective tissues of the organs. The new growth of tissue may commence chiefly in the interlobular septa, as when pleurisy is the starting point; in the walls of the alveoli when catarrhal or rarely lobar pneumonia or collapse is the foundation; or around the bronchi when the affection rarely results from chronic bronchitis, and dilated bronchi come first, fibroid induration afterwards. The commonest cause of extensive fibroid induration in children is catarrhal pneumonia, such as results from hooping cough or measles, and collapse of lung after pleurisy or empyema. Sometimes fibroid changes occur after primary tubercle, and as a curative process; they rarely extend beyond the limits of the original disease, and may best be regarded as a thick scar.

Children do not suffer from the fibroid lung that results from the prolonged inhalation of irritant particles—miner's phthisis, knifegrinder's phthisis. It will be seen, then, that the total pathology of fibroid lung and bronchi-ectasis is practically the same in adults and children. I must therefore be pardoned if I say no more of the matter in a work of this kind. Bearing in mind what has already been said concerning the physical examination of the thorax in children it will be unnecessary to state more than the following facts anent the *physical signs* of the disease under consideration:—Retracted lung and side of chest (unless the abdominal organs are drawn up—by the contraction and other causes—so as to prevent the lower part of the chest from falling in); lowered shoulder; dislocated heart, unless adhesions of pericardium and pleura prevent, to the right

when the right lung, to the left when the left lung is affected, upwards when the upper part of the lung is the first seat of the disease; wooden dulness and marked sense of resistance on percussion; respiration sounds various in site and quality, weak, bronchial or tubular; vocal fremitus and resonance increased or diminished, varying at different parts; and diminished mobility of retracted side with increased movements and expansion of healthy lung and side. The chief *symptoms* are a want of fever and paroxysmal cough, with expectoration of large quantities of offensive muco-pus from the dilated bronchi. I say expectoration, because, at first involuntarily, and later voluntarily, the child does eject the stuff from the pharynx. It may swallow some, but the paroxysmal cough often leads to vomiting. There may be pains about the chest, some shortness of breath, and when the disease is advanced, anæmia and emaciation. But children, like adults, often bear this very chronic complaint without loss of weight —often, indeed, with increase of adipose tissue, especially when too much sugar or carbohydrates are taken. Any intercurrent affection may lay the child up, but, considering the state of the lung, it must be confessed that the liability to bronchitis and broncho-pneumonia is no greater than might reasonably be expected.

A *fine climate*, with but little change in temperature, may prolong cases of the kind indefinitely, and without the interruption of an existence of moderate enjoyment. This fact gives the clue to the chief principles of **treatment.** We have already had to repeat the factors that make *for* the preservation of health in childhood, so that here we need dwell only on the most important hygienic items. The air that enters the respiratory passages should be perfectly free from chemical, mechanical, and vital impurities. It should be a pure germless aseptic air, free from excessive moisture and not too cold. Residence in a city or town is hygiologically

a perfect abomination in the treatment of cases of this kind. The clothes of the patients give off quite enough mechanical fluff, not to say chemical and vital irritant particles, without the doctor having to contend against or the patient to withstand the impure additions to the atmosphere of our towns and cities. If the child is so poor that nothing in the way of a pure atmosphere can fall to its lot, at least it should be provided with a respirator to filter the air before it passes into the anterior nares or os.

Exercise in mountain or dry sea air is of undoubted benefit. The doctor will have to take into consideration the health of the nervous system and muscles, and especially of the respiratory neuro-muscular apparatus. When there is evident shortness of breath, as in advanced cases, the exercise will have to be mostly of the passive kind—such as in carriages, or on boats or ships. *Massage* is well worth a trial here. The danger in these advanced cases is the common one in chest complaints of overtaxed right ventricle from obstruction to the pulmonary circulation; and the symptoms are—feeble pulse, cold clammy sweating skin, pale surface patched in the usual places with purple, clubbed fingers and engorged veins. In the earlier stages the high arterial tension, glowing skin, and increased excretion that attends active exercise in the open air will tend to the discontinuance of the fibroid overgrowth, and even perhaps aid in the disappearance of some of the most recent. But how scar tissue is to be removed by any amount of cod-liver oil or iodides passes comprehension.

Now it is important that *expectoration* should be efficiently performed at least once a day when the secretions are abundant, and still more if they are of the offensive kind.

I would have no mistake on this matter. The amount of exhaustion that attends a vomiting of a few moments' dura-

tion is practically *nil*. I do not know that it is not positively a stimulant to the brain, heart and respiratory nervous centres. Every day, and preferably at the night time, four hours after the last meal, *emesis* should be carried out; it matters not what with—a tea to tablespoonful of mustard, and a half-pint or less of warm water (some children vomit with very small doses); a half-grain, repeated every five minutes, of sulphate of copper; ten grains, repeated if necessary, of sulphate of zinc; dram doses of wine of ipecac.

After a time the patient can often vomit by tickling his own fauces simply. This I knew in one case of a boy six years old. Most of these children are "old" in their ways. Indeed, this diurnal emesis may no longer become necessary, for the tubes certainly get narrowed, and their muscular tissue well-nourished, even hypertrophied, provided of course that the ulceration has not previously led to actual vomicæ.

Internal *tonics*.—In my experience there is nothing better than arsenic or strychnia with cod-liver oil in these cases. They certainly promote the nervous activity of the respiratory apparatus, and give a tone to plain muscular tissues everywhere. The liquor strychniæ may be given in full doses, ♏iii., three times a day for a boy seven years old, and after meals. The arsenic need not be pushed. The good effects are obtained by two minims of the liquor arsenicalis, taken three times a day after meals. (For the administration of cod-liver oil see p. 63.)

The object of these medicines is to improve the general nutrition, especially of the respiratory neuro-muscular system. With the same end in view, I need hardly say that a nourishing *diet* is necessary, though the appetite and digestive apparatus will have to be taken into consideration. The general instructions given under Scrofula, Principles of Feeding, and Athrepsia may be consulted for further guidance in this respect.

Other *therapeutic measures* consist in the alleviation of *cough*, and in the use of remedies calculated to *diminish* the *expectoration* and to keep it *sweet*. The climatic treatment carries out all these indications. Care is necessary to see that the indoor air at health resorts is kept sweet. But certain inhalations are also a further means. Terebene, iodine, sanitas—any antiseptic inhalation. The value of the air of pine forests here takes its stand. How are the inhalations to be carried out? The agents may be atomised by Siegle's spray, by the vapour cones, or by the steam spray, as in hooping cough (q.v.), or by some of the numerous inhalers. If the case be only a slight one, wearing a respirator for an hour or two every day may be sufficient, or breathing twice or thrice a day the vapours from a quart jug of boiling water in which two drams of Tinct. Benzoin Co. have been mixed. There are many formulas for such inhalations, and I append to this article many of them. Morphia is good for the *cough*, and, though it abates the secretion from the bronchi, it often deprives the intestines of bile, and constipates. It may be necessary in some cases, but should be given only when other general means and local measures have failed. And here let me insist on the necessity of attending to the naso-pharyngeal mucous membrane. Mopping out the back of the throat after cleansing the same by gargles and douches with a mixture of tinct. ferri perchlor. and glycerine in equal parts will often remove the cough and irritation about the larynx. (See also treatment of Rhinitis.)

Counter-irritation to the surface of the chest by iodine liniment once every day, or as often as may be necessary, to keep the skin tender, perhaps does some good, but not much. I never use blisters. Mustard leaves may be applied if bronchitis, or catarrhal pneumonia, supervene. If the breath be short, even when the patient is still, then carbonate of

ammonia and strychnia are perhaps the best *stimulants* to the respiratory centres.

℞ Ammon. Carb., gr. ii.
Liq. Strych., ♏iii.
Glyc., ʒss.
Aq. Camph., ʒiii.

for a child seven years old, every four hours. The mixture should not be continued for more than a few days at a time; should then be discontinued, and resumed if necessary. The strychnia is a rather large quantity, intentionally so.

Remedies for *checking secretions* from the tubes and improving or soothing the condition of the mucous membranes lining the respiratory passages :—

The inhalation of simple or medicated steam, from a bronchitis kettle, Siegle's spray or atomiser, Maw's inhaler, the croup kettle, iodine inhaler (slipper-shaped, Nelson's), steam draught inhaler, double-valved inhaler, Martindale's inhaler. These are useful apparatus, and may be obtained of the usual surgical instrument makers.

The antiseptic respirator, with a simple perforated arrangement of plates, between which the sponge saturated with the medicament is placed, should be of the oronasal kind. It is a far better filter than a medicament to the air tubes, for Dr. Hassall has shown that but little of the thymol, carbolic acid, or creasote, with which the sponge is charged, disappears after a few hours' inhalation.

A dram of pure carbolic acid, a dram of fir-wood oil, or these mixed; a dram of Tinct. Benz. Co.; two drams of spirits of camphor; two drams of turpentine or terebene—to a pint of boiling water, may be used as inhalations. Some employ ten-minim doses of turpentine or five of terebene pure internally, even in children. A good compound inhalation is fir-wood oil, four drams; carbolic acid, six drams; juniper

oil, two drams; comp. tinct. of benzoin, one ounce; water to half a pint; add three pints of hot water. For inhalation add one part of this solution to six parts of boiling water.

These inhalations may be employed once, twice, or thrice a day according to the amount of expectoration and stench. They may be inhaled with advantage after meals; indeed they sometimes seem to improve digestion. Occasionally nausea may be excited. Then two hours after meals is the best time. They may be inhaled ten minutes to half an hour also in relation with the degree of severity of the case. The patient should not go out in the cold air immediately after the steam inhalations. In cases confined to one chamber the spray of weak carbolic or sanitas may be kept going for many hours. Iodoform or carbolic acid may be used to disinfect sputa. Excessive secretion may be checked, again as in adults, by the internal administration of many of the above-mentioned antiseptics, by the balsams of tolu and copaiba, and by astringents of tannin and gallic acid.

EMPHYSEMA AND ASTHMA.

There is no need to waste much space on the pathology of emphysema as it occurs in the child. There is very little that may not be found in the ordinary text-books of medicine. It is important to remember that degenerative diseases are rare in childhood, and therefore one cause of permanent emphysema is absent at this period of life. But constant distension of pulmonary air cells will, I make no doubt, lead to destruction of capillaries and probably to the protoplasm and elastic tissue of the lung, though the staying powers of lung tissue are doubtless greater in the child than in the adult; therefore, recovery may be expected in them, provided the causes of the distension of lung tissue can be removed. Chronic emphysema is not

common, however, in children. When it is seen the chest is distended and barrel-shaped at the upper part, but retracted at the base. The physical signs are practically the same as in adults; the heart beats more in the epigastrium, and the liver and spleen tend to be thrust downwards, whilst the percussion note is drum-like, and wheezy sounds are heard, with weak, high-pitched, often harsh breathing. Asthmatic paroxysms are frequently associated. Of the relation of asthma to scrofula I am in some doubt, though some authors speak positively on this point, and regard the paroxysmal dyspnœa as the effect of large mediastinal glands. Emphysema is very likely to be associated with chronic bronchitis. Of the interlobular emphysema, which is like true surgical emphysema, but little need be said; it may lead to emphysema of the mediastinum and sub-fascial connective tissues of the neck and to pneumo-thorax. (For an instructive paper on emphysema and pneumo-thorax in relation to tracheotomy and artificial respiration, see Dr. F. H. Champneys' papers in the "R. Med. Chi. Trans.") The occurrence of *acute distension* in the course of bronchitis, hooping-cough, and the like, cannot alter the treatment of these diseases, though the practitioner will regard it as indicative of supporting the patient, of relieving his cough, and of stimulating the respiratory centres and circulation so as to combat any sense of shortness of breath that may be attributed to it.

Subcutaneous emphysema may occur in the neck, and even spread over the whole body of children as the result of severe coughing; the skin would be of normal colour. It may be associated with pneumo-thorax.

I have never seen a case of interlobular *cervical emphysema* that required special treatment. It has been recommended to puncture the skin and let out some of the air and to infrict oil into the skin over the emphysema with a view of promoting the absorption of the air. If pneumo-thorax should occur it

had better be left alone, and trust placed in stimulants to relieve the present distress. Some recommend aspiration and puncture, but these should not be practised unless the distress be very urgent.

Of *persistent emphysema* the *treatment* should be the same as for chronic bronchitis. Ancient rickets often coexists in greater or less degree. Treatment aimed at the preservation of health and the prevention of catarrhs and digestive derangements must be specially insisted upon. These measures will prevent the catarrhs from keeping up the emphysema. And we may hope that the *climatic treatment*, together with the employment of measures calculated to increase the powers of the neuro-muscular apparatus (gymnastics, massage), to promote the intimate nutrition of the tissues of the body generally, and of the lungs in particular, by cod-liver oil and steel wine, will effect all that is possible on the surface of this earth. Mountain air with a low barometric pressure is considered by some to be injurious to cases of emphysema, whilst the surface of the sea with a high atmospheric pressure is recommended. I have certainly seen one case of chronic bronchitis and emphysema immensely benefited by a stay of six months at Davos. An elevated dry inland air in England may suit quite as well. Rarely does a moister atmosphere at a lower elevation suit bronchial asthma. But the great want is perfect freedom from pulmonary irritation. Irritation may come from without and from within. *Catarrhs* are promoted, perhaps, as much by irritation arising *in the blood* (as the result of the imperfect performance of the excretory and other functions of the liver, skin, kidneys, and alimentary canal) as by

due to chills, sudden variations of atmospheric and temperature, clouds of dust, or the more lust of apartments and houses. Not only is irritarnal and external, to be prevented, but the internal

and external conditions of healthy existence must be of the best possible kind that can be obtained.

The *appetite* may need stimulating by gentian and alkalies, by alcohol or by tonics, such as nitric acid and bark; the protoplasm of the body may work better under the influence of cod-liver oil, arsenic, and other tonics. (For mode of administration see Scrofula.)

The *skin* may be kept in a healthy state by careful clothing in woollen combination garments, the hands and feet being kept warm. The sweat glands of the soles and palms are two of the most important agents in excretion, and possibly in the maintenance of body temperature. Bathing with tepid or cold water, so long as a reaction is obtained, will also further the health of the skin, and friction with rough towels is also valuable in filling the arteries and emptying the veins. (See "Gymnastics.") Very valuable is the use of light dumb bells and circumduction of the arms from before back, or throwing the shoulders back, all of which increase the power of the muscles of respiration, and expand the lower half of the chest whilst strengthening the spinal muscles. The nerves, muscles, heart, lungs, skin, kidneys, liver, and intestines are all influenced for good by active *exercise* in fine weather out of doors, but the fatigue point must not be reached. Exercise acts not only by improving the circulation, but also by direct stimulation of all the functions. Naturally the exercise should not be such as to tax the right ventricle of the heart, but this will doubtless in time "train on," and the circulation through the lungs be promoted.

The **paroxysmal asthmatic attacks** are usually relieved by the above measures, and especially by the discovery of a suitable climate. If they should occur, the treatment that is adopted for adults answers in these children, who are mostly not younger than the commencement of the period of second

dentition. I have found the tincture of lobelia in ten-minim doses t.d.s., jacket mustard poultices, fumes from nitre papers or Himrod's powder, the bronchitis kettle and stimulants of brandy, occasional emetics of wine of ipecac. ʒi. every ten minutes—when the cough is hard and dry and there is much struggling—or a rapid purge with a large dose of jalap, to form a sufficient armamentarium. The child should be kept in bed during the acuteness of the attack. Pyridin might be tried, but its employment would require much caution. Half a dram might be evaporated on a dish in a corner of the room, and the vapour inhaled by the patient in bed away from the evaporating liquid.

The regulation of the hours at which the meals may be taken is as necessary as the regulation of the bowels. The attacks are often nocturnal, and then the supper should be light, and consist of a cup of milk and a little custard. The principal meal should be at one or two p.m. The child should rest after its dinner, which, though substantial, should never be a big "square meal." A meal of the latter description often evokes an attack, and is one of those internal irritations that are so provocative of catarrhal asthma. The meal not only surcharges the blood, but irritates the gastro-enteric nerves, and probably works reflexly on the lungs also. Excess of sugars and starches are sure to lead to fermentations and acidity and internal irritation. Besides lobelia, belladonna and stramonium may be employed as sedatives, ten minims of the tincture of either of these three or four times a day. The stramonium leaves may be smoked, or the extract of stramonium may be given in half-grain pillules.

Genuine asthma often begins in childhood—even during early infancy. Catching cold, indigestion, constipation, are the chief exciting causes of a paroxysm which has pretty much the same characters as that of the adult, though the spasmodic paroxysm is less marked during the first two or

three years of life. There is a close association between eczema and asthma in the same child. Usually the asthma succeeds the skin disease. Other members of the family may suffer from eczema. Gout frequently coexists in the family. The bronchitis of the spasmodic attacks is apt to prove obstinate to treatment. Dr. C. West insists on a relationship between spasmodic croup and asthma. As the tendency to the former disappears, the latter comes into prominence. Emphysema results from the obstinate bronchitis. The character of the attacks usually changes about the period of puberty. The disease has practically disappeared at this age in some cases. Thymic asthma is an ancient designation for laryngismus stridulus.

Treatment.—Avoidance of the exciting causes above-mentioned. *Sea voyages* are very beneficial. Cod-liver oil and arsenic should always be prescribed. (See Scrofula.) Other tonics may be given as for scrofula.

Alteratives.—Iodide gr. ii., and bromide of potassium gr. v., diminishes the liability to attacks, given twice or three times a day an hour after meals.

The *climate* that suits the individual case should be discovered, and a long residence therein recommended. In those cases called "bronchial asthma" the sequence of repeated bronchial catarrh, a seaside climate, like Bournemouth, which is warm in winter, is generally the best.

Treatment of *attacks.*—Ether and ammonia mixture.

℞ Spt. Ether, ℥vii.
Spt. Am. Arom., ℥vii.
Tinct. Aurant., ℥iv.
Aq. Camph., ad. ℨi. t.d.s.

Hot mustard foot-bath.

An emetic of wine of ipecacuanha and a brisk purge of calomel gr. ii. and scammony cut short the attack.

Tea and coffee should be avoided in children. They are

likely to increase the abnormal discharging tendency of the nerve centres.

The general treatment for *bronchitis* should be carried out. Tincture of lobelia inflata in large doses (six to 15 c.c. in a julep in 24 hours) has been successfully employed by Moncorvo, of Rio Janeiro, in infantile asthma. It is given during and after the attacks.

Lobar Pneumonia.—The resemblance between lobar or croupous pneumonia in the child and adult is fairly close. The difference between the disease in infants under two years of age and adults is fairly great.

The *younger* the patient the more frequently do convulsions replace shivering at the onset of the fever, the more likelihood is there of severe cerebral symptoms of the comatose rather than of the delirious type, and the less chance is there that rusty sputa will be seen.

The onset of primary lobar pneumonia is nearly always sudden, with high fever, headache, often vomiting and rapid prostration. The duration of the fever, which usually terminates suddenly, is about seven days. Epistaxis is not unfrequent. A short hacking cough and hurried breathing (60 per minute), the pulse-respiration ratio (two to one, instead of four to one) being disturbed, and perhaps expiratory respiration, with hot pungent skin, are valuable signs in the diagnosis. There may be severe pain in the side. Sometimes the head symptoms are the most prominent features of the case—"*cerebral pneumonia*"—but they usually subside after two or three days, when the lung consolidation has fully developed.

Apex pneumonia is fairly common in young children. It is not attended with special dangers in them, although severe head symptoms and delirium occur more frequently with it in adults.

Double pneumonia may occur in infants; it is a very

serious disease, usually attended with coma ; but death, though common from it, is less common than in double pneumonia in the adult. Delirium of speech does not occur in infants under two years of age, suffering from severe pneumonia. Loss of any speech they may have is most common. Sometimes bowel symptoms—diarrhœa—attend the onset of pneumonia, and may make the doctor think of typhoid fever in older children, and gastro-enteric catarrh during the first dentition, both of which may begin promptly with high fever and headache. But the hurried breathing, short, single cough, flushed cheeks, and early delirium and altered pulse-respiration ratio, are usually adequate for the diagnosis.

Herpes and jaundice may occur as in adults, and so may the other complications or sequels. As to the physical examination, bearing in mind what has been written in the introduction to the section on Respiratory Diseases, but little need be said. The greatest fact of clinical importance is that percussion and auscultation may fail to say for certain whether it be solid or fluid causing the dulness and altered breathing. Usually the dulness of pneumonia is less marked and less resistant than when there is fluid effusion. The breathing in consolidation from pneumonia may be perfectly tubular, or simply very weak. (See Pleurisy and Empyema.)

Cases may be met with in which all the symptoms, including the mode of onset and termination by crisis, occur after the usual duration—five to eight to ten days—but in which no physical signs have been detected ; *masked pneumonia* where the consolidation is probably central, and surrounded by healthy lung parenchyma.

On the other hand, latent pneumonia may occur in the course of *other diseases*. In these cases the symptoms are masked, but the physical signs often typical. Careful examination will usually reveal an increase in the number of respirations, and perversion of the normal ratio between

pulse and respiration. The *treatment* of them must be in accordance with the febrile or other (Bright's) disease, which they complicate, and this treatment will almost necessarily be of a stimulant kind. Renal pneumonia is a very serious complaint. (See Renal Diseases.)

Pneumonia, like rheumatism, tonsillitis, laryngitis, and other complaints, does not protect from, but rather predisposes the patient to another attack. Hence the necessity for keeping away from all those influences which may induce or predispose to the disease. This would mean the avoidance of cold and wet, and sudden changes of temperature in the environment. It would also mean the avoidance of fatigue either of mind or body, and the observance of those laws calculated to promote personal hygiene and good general health. Some observers regard pneumonia as a contagious and epidemic disease. The discovery of the pneumococcus by Friedländer and others is supposed to favour these views. Although lobar pneumonia is sometimes epidemic, and may be contagious, there is scarcely any need to isolate the patient strictly, though it is decidedly for his benefit that he should be put in a room apart in the least noisy part of the house. The hygiene of the room should be perfect in every way, like the room used for fevers. The cot should be kept out of the way of draughts, and this is best secured by using the tent-bed. Constant nursing of young infants increases expenditure of energy and tends to increase exhaustion. They should be kept in bed in the horizontal posture. Struggling should be avoided, for it increases exhaustion.

The great principle of the *treatment* of pneumonia is to bear in mind the neuro-muscular prostration and the tendency to cardiac failure. *Depletion* at the outset can be but very rarely necessitated. I have never practised it. Even comatose infants with double pneumonia would probably not be saved

by it. Here I prefer cold affusion to the head, and the hot mustard bath to the body, which certainly seems to brighten the child, at least for a time; such infants, if they escape the Scylla of coma, fall into the Charybdis of collapse, and I place them side by side with cases of malignant acute specifics, from which the diagnosis cannot always be made this side of death.

For an ordinary case, say in a boy five years old, the *expectant* treatment does all that is necessary. The child should lie down in bed, and should be fed at regular intervals, taking care to feed him on his side, without moving him about, and always attending to his wants, so as to demand from him the least possible expenditure of force. In asthenia a frequent change of posture may prevent hypostatic congestion. Children very ill must be moved with great gentleness and caution, lest syncope and convulsions supervene. Every active movement of the patient should be prevented.

Restlessness and *delirium* are best treated by sponging the skin with tepid or cold water, as the patient lies on the mackintosh; or by rolling in a wet pack, or placing on a cool water-bed. Sleep by the same means is often procured. Most valuable indeed is a dose of opium (chlorodyne ɱv.), repeated if necessary; or half-a-dram of syrup of chloral and five grains of bromide of ammonium. Restlessness may be traced to a loaded bowel, and the tongue may be more than usually furred. A dose of castor oil repeated every day or other day may put the child in a more favourable state. Repeated powerful purgatives reduce the strength, and should not be prescribed. For *a very hot skin* the sponging will do good. A *diaphoretic* of liquor ammoniæ acetatis ɱxxx. every four hours, with some camphor water, or five grains of citrate of potash, t.d.s., in aromatic water, may be ordered for a child five years old.

Pain in the side, causing restlessness or complaint, needs hot spongiopiline frequently renewed. Hot fomentations—covered with oil silk of course—or poultices, are equally useful, but the former more difficult to apply, and the latter, though comforting, dirty, and only to be trusted to a skilled nurse or her equivalent. When the hot applications are finished, wrap the affected side up with cotton wool till convalescence is thoroughly established. Instead of the hot and moist application to the side, some doctors prefer hot bags of sand and brand—*dry heat*. Others use with equal success cold wet compresses, or even ice bags to the side. Ice bags are highly lauded indeed as anodyne, antipyretic and antiphlogistic.

Troublesome cough is relieved by the spray of carbolic acid, especially when resolution is taking place and the signs of bronchitis are present. In the earlier stage the short hacking cough is abated by depressant expectorants, and five drops of ipecacuanha may be added to the Liq. Amm. Acet. ℥xx. for a child of three.

Spiritus ætheris nitrosi, as a diaphoretic and diuretic, goes well with it. A few drops of Tinct. Camph. Co. and bicarbonate of soda may be introduced to lessen gastric and cerebral irritability.

℞ Vini Ipecac., ℥v.
Sodæ Bicarb., gr. iv.
Spt. Æth. Nit., ℥v.
Tinct. Camph. Co., ℥v.
Aq., ʒii.

every four hours.

Ineffectual cough interdicts opium; steaming and stimulants are its wants. And attention must be directed to the right side of the heart and to the full venous, but empty arterial system.

Stimulant expectorants.—Erroneous is the entertainment

of the idea that pneumonia indicates carbonate of ammonia. Valuable general and respiratory stimulant, it may not be needed, or may be contra-indicated by a hard, dry cough. Give it when the stage of redux crepitation sets in. It then promotes expectoration, and doubtless aids absorption. One grain is the dose for one year, and two for two years, given in aromatic water and syrup of tolu every four hours. Three grains may be given after five years. Four grains is an adult dose. In cold milk it is generally well borne by the stomach.

Thirst is best relieved in infants as others by small doses (℥i.) of cold filtered water, or the child may be sensible enough to suck ice. It is bad doctoring to refuse water to a child. But the doses should be small and frequent so that they may be absorbed. Screaming and restlessness may subside suddenly after a drink of cold water.

High fever, which usually goes with restlessness, is best reduced by the use of cold water, as above mentioned. Quinine is often given for this fever. It does no harm, but I seldom use it. It may be given in five-grain doses to a boy five years old, and repeated. But I do not advise it.

The *diet* during the fever should be liquid, and given in small doses frequently—mutton broth, weak beef tea, milk and barley water, &c. Absolute starvation at the initium is not necessary. When the *temperature falls*, or is *about to fall*, care must be taken to support the patient by more nourishing food (meat juice, eggs, strong beef tea), and if necessary stimulants (brandy). The indication for *stimulants* is a very rapid pulse, especially if irregular in force and rhythm and out of proportion to the temperature.

Should *diarrhœa* be present it may be often controlled by a teaspoonful of castor oil. If it continue after this the food should be given cold, and a thin starch enema, ℥i., with ten drops of laudanum thrown into the rectum of a child five years old, is the best treatment. In three cases of the severe kind

that I have seen this succeeded. But chalk and catechu mixture, with aromatics, may be used if required.

℞ Tinct. of Catechu, ℥xx.
Spt. of Chlorof., ℥x.
Mist. Cretæ, ʒiii.

for a child five years old.

The diarrhœa may be kept up by the child kicking the clothes off in its restlessness; the restlessness must be controlled, and the belly should be protected by a uniform bandage of flannel to prevent its surface cooling, and thus to avert peristaltic action and diarrhœa.

Blood-letting.—The question does arise at times how to relieve a patient whose *pulmonary circulation and right side of the heart* is engorged and overloaded, as the effect of the obstruction to a large area of the pulmonary capillary circulation by the fibrinous exudation. If the lividity be great, and the distress evident in the recession of suprasternal and supraclavicular fossæ, and imperfect inspiration, the removal of two or three ounces of blood from the arm of a child five years old, suffering from primary lobar pneumonia, will do wonders, as I have myself seen. It must not be repeated. Stimulants would fail under these circumstances, and the obvious method is to unload the venous system and the right side of the heart. Remember that unloading the right ventricle and stimulating the same, though seemingly antagonistic measures, are really not so. Full bounding pulse, severe pain, wide extent of dulness, should not be treated by blood-letting; nor acute pneumonia at the outset, even in healthy children. The only occasion is the imminent danger referred to already.

Dry cupping and leeching over the inflammation when the pain is severe, temperature high, pulse bounding, is still practised by some—two or three cuppings, or two or three leeches. I have seen this give relief or be followed by relief,

but think it unnecessary. A wet pack relieves the circulation and nervous system more efficiently. Moreover, children with the sthenic symptoms mentioned are half way on the road to collapse. It is the excitement preceding paralysis. I prefer turpentine fomentations or well-made poultices to dry cupping or leeching.

Antimony and calomel, either in large or fractional doses, as rapid depressants or more continuous antiphlogistics, are now utterly and justly condemned.

I have hinted at the development of *collapse* at the critical period of termination of the disease. Sometimes delirium may occur in children of some years of age at this epoch. It indicates the necessity for free stimulation, and the pulse should be narrowly watched.

Convalescence is promoted by the employment of bark and of iron wine if there be anæmia, and by judicious feeding.

℞ Ext. Cinch., Liq., ♏iii.
Spt. Chlorof., ♏iii.
Glyc., ♏x.
Decoc. Cinch., ʒii. t.d.s.

Children often cry for food after the crisis has occurred, but for them to be allowed to partake of a large meal—say of potato or bread-and-butter—is very bad nursing. A little fish may be permitted on the first day, and a little custard the next, and so the ordinary food may be gradually acquired by successive stages. The scientific reason for this staircase method is that the digestive glands take a day or two to return to their full activity after the departure of so severe a fever. Hence, if food be too abundant or unsuitable, irritation and intestinal catarrh, &c., may follow.

Salines, diaphoretic and diuretic, are commonly prescribed in all cases of fever. They are unobjectionable, but in many cases entirely superfluous. Citrate of potash, gr. ii.,

every four hours in camphor water or plain water, may be given at two years of age. Scanty urine may be treated by it, and by sweet spirits of nitre.

Quinine is another drug in common use in pneumonia. It is a antipyretic and antiphlogistic and very valuable, but unnecessary in the majority of cases. In grain doses during convalescence, and with a few drops of mineral acid, it may be more frequently needed.

Blisters are now almost never used. Mustard foot-baths are better derivatives, or mustard poultices, composed of one part of mustard to four of linseed, to the chest. The skin must be protected by muslin over the mustard. The charta sinapis, for ten minutes at a time, and renewed every few hours according to the pain and dyspnœa, is equally effective as a counter-irritant, and consummately cleanly.

PLEURISY AND EMPYEMA.

It is not true that all serous effusions tend to become purulent either in the child or in the adult. I have drawn serous fluid from the same side of the chest of the same child at an interval of six months, and I have done the same thing in adults. The most important matter is a difficult one, the determination of the solid or fluid nature of a chest lesion. This is frequently a physical impossibility, by which is meant that physical examination will not avail. And there are cases in which neither the history of the case, the present symptoms, or the physical examination—all put together—will enable a diagnosis to be made. The *hypodermic syringe, or better, a special exploring syringe* must command the very highest position as a method of physical examination. But its authority is not unimpeachable. It may say No when there is fluid effusion, and sometimes it says Yes when the lung or bronchi must have yielded

the dram of pus that is never after got again. No age is exempt from simple pleurisy.

Of the *plastic* pleurisy that usually complicates pneumonia and tubercle, nothing need be said, as, with the exception that the pain and cough may require special consideration, the treatment of the pleurisy merges into the treatment of the disease which it complicates. Occasionally the pleurisy of scarlet fever remains without effusion, but generally this fever must be regarded as one of the most frequent causes of purulent pleurisy or empyema. That some cases of serous effusion are due to suppressed or masked rheumatism is undeniable, and the idea of rheumatism as a cause should be harboured before we invoke the aid of vaguer causes, such as impure air and chill, both of which may, however, be efficient. Bursting of abscesses or other morbid products into the pleura is a not unfrequent cause of pleurisy in children. Sero-sanguineous pleuritic effusion rarely occurs in children. In one case in a boy aged six there was no cause for it that could be made out. He remained under inspection twelve months, and appeared to have recovered his usual health before the end of that period. I have seen another case post-mortem where there were secondary sarcomata in the lungs.

The *onset* of pleurisy may be rapid, and signified by the occurrence of some few symptoms, such as chilliness, pain in the side, headache, restlessness, a feeling of distress or malaise having a definite mode of commencement, and for which the child can give no explanation.

But *latent* pleuritic effusion is not unfrequent, the first symptom being shortness of breath on exertion, or feverishness, or there may be nothing to attract attention except the disappearance of the appetite.

There is usually some *fever* that does not reach above 102, and subsides in the course of two weeks, unless the child be highly neurotic, or unless the fluid become purulent. In the

latter case—empyema—fever usually goes on for some four weeks, and then may almost altogether disappear, unless the child be scrofulous. In the scrofulous an empyema may continue to excite fever, of a hectic type. The pleuritic effusions that occur in the cachectic or greatly debilitated may be altogether apyrexial; the centres governing body-heat seemed to have shared in the general cachexia, and no new lesion seems capable of moving them from their low ebb of existence. The breath may be short, but there is usually no derangement of the normal ratio between the respirations and pulse. The cough occurs as short, single, dry and hacking expirations. A long-standing empyema may cause marked clubbing of the ends of the fingers and toes and of the nose, great sallowness and anæmia with emaciation, a harsh and dry skin, which may sweat profusely at times, especially about the head, palms, and soles; these regions indeed are often moist even when the skin is elsewhere dry. A serous effusion may cause slight clubbing of the finger ends, but the congested swollen tips of the fingers and toes are more rapidly produced by empyema than by chronic heart disease or chronic lung disease. Clubbing of the fingers occurs with greater frequency and with greater facility in infants than older children, and in the latter than in adults.

The *physical signs* of a large fluid effusion are absolute putty-like dulness over the whole side with displacement of the mediastinum and heart. Vocal fremitus is rarely available. It is useless *qua* treatment to practise auscultation. A side which is absolutely dull requires the insertion of the hypodermic or exploring syringe, and these explorations should be two or three in number, and afterwards repeated on different days. A great sense of resistance to the finger and short wooden note are signs demanding the use of the syringe. *Auscultation* is tantalising, to say the least. There may be tubular blowing or simply very weak breathing, which may

have a distinct tubular quality. There may be adventitious sounds, and I do not hesitate to say that I cannot distinguish for certain between a sound that originates in the pleura and one that comes from the lung. Coughing may clear away mucus in the tubes, and so be of some value, but the act of coughing may be followed by the disappearance of the sound when the case is one of pleurisy. Displacement of heart is a very valuable sign. It is not always easy to say whether the liver and spleen are displaced or enlarged. A fluid thrill may be obtained across an intercostal space in the same fashion as occurs in abdominal effusions.

The signs that tell for *empyema as against serous effusion* are emaciation, anæmia, long duration, with sweating, fever, clubbing of fingers, œdema of the affected side, with extra heat of skin there and enlargement of veins. As will be gathered during the first weeks a diagnosis is only to be made certainly by seeing the fluid in the exploring syringe. Empyemas may burst in any direction just as in the adult.

None of the lung consolidations give a duller note than that of fluid effusions, but the note may be quite dull, with collapse and fibroid induration and sarcoma (a rare affection in children) of the lung and pleura. Sometimes a dull note of tubular or tracheal quality may be elicited in cases of pleuritic effusion, but it has no special diagnostic value. Genuine ægophony or bleating character of the vocal resonance is highly significant of fluid effusion; but in fluid and solid affections alike there may be increased, diminished, or abolished vocal resonance. Some of the most puzzling cases are those of localized or loculated empyema, the pus being limited to a single well-defined area. Exploration with the syringe of any patch of dulness that has lasted more than a week, will usually show the way out of the difficulty. A patch of lobar pneumonia, or one of phthisical consolidation or sarcoma, or loculated empyema, may yield identical physical

signs. The canon of infantile pathology that inculcates the great tendency to the generalization of disease in children is well illustrated in purulent pleurisy. I have thrice made post-mortem examinations of infants in which the pleura, pericardium, and brain-pan were the seats of purulent effusion. This tendency to spread is greater the younger the patient.

The **treatment** of pleurisy is best divided into two sections —*medical* and *surgical*.

Plastic pleurisy if primary may be treated by confining the patient to *bed*, so as to prevent the lungs from doing more work than is necessary. Pleural irritation is thereby prevented; the pain will also be relieved. If the *pain* be very severe, a mustard poultice to the side will often give comfort and act as a *counter-irritant* to the pleural inflammation also. The *cough* may be relieved by a linctus of glycerine ʒss., Tinct. Camph. Co. ɱx., Aq. ʒss., for a child two years old. It is rarely necessary to do more than the above either for the pain or cough. In older children strapping the side to prevent movement is useful in relieving both the cough and pain. Pain is occasionally agonizing, and may be relieved by a tenth of a grain of morphia injected over the seat of pain, or by a full dose of Dover's powder, say five grains, for a boy five years old. In the early days of serous effusion rest in bed and hot fomentations or poultices may be the treatment. The *withdrawal* of enough fluid to make the diagnosis is often sufficient to start absorption of the fluid. When all pain has subsided, further attempts at promoting *absorption* may be made by iodine painted on the surface of the affected side over the whole area of tenderness and dulness; the iodine liniment may be used as a stronger application than the tincture, though the latter may answer all purposes in some children with a delicate skin. The skin should be kept sore by this means, the iodine being renewed every other or third or fourth day as may be judged

in each case; slight vesication is the most that should be caused. I never use actual *blisters* or blistering fluid, but if the blistering fluid does not vesicate it is as useful though more dangerous than the iodine. *Restriction* of the *amount* of *fluid* taken in the twenty-four hours is an important means of promoting absorption of a pleural effusion. If possible, the child should not take more than ten ounces of liquid in the 24 hours. This is a little cruel at the time, but if it can be persevered in may be very successful. For infants under the age of twelve months the amount of fluid must necessarily be larger. It is customary also to give five-grain doses of iodide of sodium or potassium three or four times a day in the decoction of cinchona ʒii. to a child five years old. In some cases the fluid is rapidly absorbed under this treatment. But there are other effusions that hang fire, and yet again others that become purulent.

In children who are already debilitated or cachectic, the absorption of the fluid effusion by means of *sweating* and *purging* is not good treatment, unless the agent that causes the sweating or purging be also tonic to the heart and nerves. Hence sweating, whether produced by the hot-air bath, by dram doses frequently repeated of the Jaborandi infusion, by $\frac{1}{20}$th grain doses of pilocarpin under the skin, should not be employed unless the boy is fairly robust, the pleurisy primary, and the heart not greatly encumbered. Purgings, too, should be avoided for the reason that they reduce the strength. At the same time the bowels should act once or twice a day, if necessary by castor oil or liquorice powder. Tincture of digitalis in minim doses every four hours, with three grains of acetate or nitrate or citrate of potash in a tea-spoonful of water, may be given as a *diuretic* to a child three years old when there is an objection to removal of the fluid by aspiration.

Indications for aspiration.—An effusion that has lasted

two weeks, and in which all acute signs have disappeared, requires aspiration. Actual want of breath whilst the child lies in bed—as indicated by the puffy face, sensations of the child, hurried respiration, extreme pallor, or slight lividity of lips and nails—is an urgent demand for *aspiration*. Such cases may succumb suddenly from over-taxation of the right side of the heart. Sometimes *syncope* is suddenly induced without warning either the patient or the doctor by any of the signs of *dyspnœa;* therefore any *large or rapid effusion* urgently calls for aspiration.

Method of aspiration.—The aspiration of a serous or a purulent effusion should be performed as follows:—The patient should be lying down on or towards the sound side. The apparatus, and especially the trocar and canula, must be rendered perfectly clean and aseptic by boiling water and carbolic acid 1 in 20, or corrosive sublimate 1 in 500. The skin over the axilla, where the puncture is to be made, should be cleaned also in an aseptic fashion. The needle should enter the lower part of the 6th or 7th space in the mid-axillary line. The bottle should not be made a perfect vacuum to start with. Indeed, two or three strokes of the piston are all that I use at the commencement. The fluid from the pleura does not then spurt into the bottle, but flows in a remittent fashion in harmony with the respiratory movements. The slow withdrawal of the fluid is the best safeguard against such an unfortunate occurrence as sudden death from syncope, the result of disturbances in the circulation due to the sudden or rapid removal of pressure. Sometimes cerebral embolism has been thus induced. The fluid need not be withdrawn to the last drop. A hacking cough usually comes on, and then the aspiration should generally be stopped. Any spitting of blood or the slightest sign of distress should be met by the administration of stimulants and the withdrawal of the needle. In he insertion of the needle it is best to give an anæsthetic,

though in young infants it is not necessary, for the smart introduction of the needle is attended with but little pain. The needle should not be entered further than is necessary; as soon as the first plunge has been made through the parieties the trocar should be withdrawn to see whether the fluid flows. If it do not, then the cannula may be pushed gently further in. If then no result, the trocar may be reinserted care being taken to prevent the entrance of air.

Non-escape of fluid.—The fluid may not escape (1) because false membranes are pushed in front of the orifice of the cannula; (2) a flake of pus or cheesy matter may block the needle. A second and sharper plunge to a greater depth may overcome the obstacle presented by false membranes.

In order that the fluid may escape, it is necessary that the space which it has occupied should be taken up by something else. This something may be some compressed lung expanding, the ribs falling in, or the diaphragm rising. If neither lung expands, ribs retreat, nor diaphragm rise, then escape is impossible. This difficulty is of rare occurrence, and is seen in my experience in old cases of empyema, in which there is considerable retraction of chest-wall and a hard, fleshy lung. But I have gradually been led into the subject of the treatment of pus in the pleura, and must now return for a moment to the serous effusion. It may be that the aspiration will require *repetition*, but this should not be done at less intervals than a fortnight, provided the above-mentioned serious indications are not present. After the aspiration it is well to strap the side up in strips of plaster and to continue the dry diet in bed, and also the iodide of potassium mixture. When all effusion has gone the physical examination may show retraction of the side (an angularity of outline that fits well into the space between the outspread fore-finger and thumb) with spinal curvature, concave towards the retracted side, and some even considerable dulness,

weak breathing, and weak vocal fremitus. If fluid be absent, and there be no fever or pain, as ascertained by explorations, the boy may go to the seaside with a tonic of bark. Exercise in the open air, at first gentle, and gradually more vigorous, will usually expand the lung, remove the spinal curve, and diminish the dulness and weak breathing, until finally all morbid signs disappear.

Climatology is an important item in convalescence and final cure. Dry and bracing sea air is the best tonic. It should not be too bracing if the circulation is feeble. The east coast is suitable in summer, say Cromer, Southend, Broadstairs, Folkestone, or Margate.

The **treatment of empyema** may be carried out on the same lines as for serous effusions. Urgent is the demand for the evacuation of pus. Thin laudable fluid, aspiration, if repeated twice or thrice at intervals of a week, may succeed in evacuating. The evacuation must not be too rapid when the pleura is over full, lest syncope supervene. *A large empyema wants immediate incision.* I confess to a dislike to aspiration after the second time. We want the pus away, and there is nothing like a free opening—not as wide as a church door, but such as will suffice—into the side under strict antiseptic precautions—Listerism with the spray, and with every attention to minute details. The incision should be made in the midaxillary line about the seventh space. It may have to be made elsewhere in some cases. Occasionally *two openings* may be necessary, but not often. Free drainage is the desideratum. False membranes must be removed completely. *Occasionally*, indeed, the empyema seems to be mainly composed of these solid exudations of variable and varying consistence. *Resection of ribs* is requisite if the ribs are close together, or if a single opening in the axilla does not permit of free drainage. Resection of one, or two, or three ribs (Œstlander's operation) over a space of two inches more or

less, according to circumstances, must be performed. This is a fundamental necessity in chronic empyemas with retracted sides and hard, tough lung. Whatever surgical measure is necessary for the establishment of perfect drainage, that should be done, and the surgeon should be allowed a free hand. The physician is merely to watch the pulse, tongue, temperature, and nervous system. He may gauge the strength better than the surgeon, but he must not meddle with the latter when he has given the order to make free drainage. The perfection of the drainage of the abscess will be seen in the gradual, often speedy, diminution of the discharge, in the filling up of the cavity, in the disappearance of fever, and in the presence of increasing weight and colour of the child. Avoidance of permanent fistula and collapsed lung are paramount considerations. The varieties of *drainage tubes* are numerous, but these and other questions should be left in the hands of the surgeon who is called in to the case. One word about the *washing out* of the pleura. It should never be done in any simple case as a routine measure. In simple cases the free drainage is sufficient. Where there is *fœtor* the surgeon may clean out everything in the pleural cavity, and use aseptic lotions at the time of the great operation, but these are not often necessary after the hole has been rightly made for drainage. *Fœtor* is a sign not for aseptic lotions, but for further *surgical interference*. It may be due to necrosed ribs, which should be resected, or to pent-up pus, which must be got out, or to putrefaction in lumps of lymph requiring removal. The washing out of the pleura has several times led to sudden death from coma or syncope. Repeated washings with carbolic acid to carboluria and nervous symptoms dependent on the carbolæmia.

Evacuation of extreme effusion has led to suffocation and syncope, doubtless from disturbance of the cardio-pulmonary circulation. Slow and steady escape is secured

easily. The incision may be but a puncture; then a slight and slow escape follows. Gradually the tension is relieved, and time is allowed for compensation of the circulation. Aspiration by the slow method is recommended as a preliminary in such states.

Other methods of evacuation.—Simple tapping with trocar and cannula is a barbarous measure in these days of Listerism. Two openings, one in front in the second or third space and one behind in the tenth space, a drainage tube passing from one to the other, may rarely be required. The syphon plan is an accessory to the trocar and cannula method. A long india-rubber tube, divided by a glass tube in its middle, reaches from the chest to the basin on the floor. The basin contains some antiseptic lotion, and the end of the tube must be under its surface. This is valueless frequently, because plugs of pus prevent the passage of fluid, and because a flow does not occur unless the side sinks in, the diaphragm rises, or the lung expands. Whatever method be employed, cleanliness to asepticity should be practised, but I cannot recommend any of these last considered methods.

The *site of evacuation* may be variable. Extensive empyemas are easily evacuated in the site selected. Any part of the pleura may be punctured and drained. Loculated matter should be removed wherever found. Spontaneous pointing may be allowed to proceed to bursting. The abscess may then be drained from that spot. An opening in the upper front of the chest drains badly. Pointing here should be prevented by axillary aspiration or incision. Pointing at other parts may be selected as the site of evacuation.

Removal of drainage tube is effected gradually by shortening daily or every two days. A cavity that continues to discharge, and continues to require a long drainage tube, is a cavity that requires more surgery. It shows that something is unsatisfactory; that the space is not being filled up. The

antiseptic dressings should be maintained till the discharge is so slight as to need a dressing but once in four days. The existence of a minute fistula or an inch of drainage does not require distension. A little iodoform or boracic ointment suffices.

The *dietary* and *stimulants* must be arranged in accord with the patient's general state. In primary plastic pleurisy and serous effusions it should be unstimulating and low—a milk diet.

Cachexia or debility or evidence of struma, clearly requires a nourishing diet and stimulants. An inflammation in a robust child will be increased by good feeding and stimulation, but diminished in a feeble child by the same measures. The very continuance of the inflammatory disease is dependent on debility. Even in empyema, then, the hygienic treatment, such as is described under Scrofula, is most important. As has been indicated, cases of pleurisy and empyema of primary sort in children, weak, but not scrofulous, have been clearly traced to *bad smells* in their dwellings. Small doses of brandy or port wine or sound claret with the meals may give appetite, aid digestion and circulation, and effect a surprising amount of good in feeble children with or without empyema. The value of iron and quinine, or liquid extract of cinchona, in these anæmic and feeble ones is due to their influence as general *tonics* and *hæmatinics*. *Fancy* diet may be ordered for cases of empyema. It may be necessary to prescribe pancreatized food, or pepsin. Alkalies and gentian may be needed to give appetite and correct acidity. The profuse *sweating* of empyema disappears when free drainage is established, but it occasionally continues as the result of a habit of the nervous system. A drop of liquor atropiæ for a boy of five will usually check this. It may be repeated two or three times. It should be given two hours before the onset of the sweating. The bed linen should be kept sweet and clean,

and the cause of ill odours discovered and removed. The *diarrhœa* of empyema has been regarded as something peculiar. This symptom, however, disappears as the abscess in the pleura is healed, and it calls for no very special treatment. Excess of undigested milk in the stools sometimes to the naked eye looks like matter. A grain of Dover's powder with three grains of bismuth subnitrate may be placed on the tongue of a boy two years old, and washed down with milk thrice a day. (See Diarrhœa.)

Even *lardaceous* disease of the liver, spleen, and presumably kidneys (albuminuria), will pass away when the abscess is healed, and the general tonic seaside treatment has been in full swing for a few weeks. I have seen cases of large liver and spleen, especially the result of Pott's disease, completely disappear without the use of any other measures than sea air, cod-liver oil and wine. But iodides are said to have a special value in being able to effect this disappearance of lardaceous disease.

For the dulness denoting thickened pleura our therapeutics are hygiene, with abundance of sea air and exercise, cod-liver oil and iodides, with iodine counter-irritation. Rapid change of tissue will be effected by such means.

Cases of empyema convalescing rapidly may be up on the couch before a fire in a week in winter; outside on a sun-shaded balcony or in a carriage in the summer in ten days.

CHAPTER VIII.

DISEASES OF THE NEW BORN.

ICTERUS NEONATORUM.

Spurious jaundice, or yellow discoloration of the skin of new-born infants, the conjunctiva, urine, and stools being natural, is due to changes in the hyperæmic skin very much like those that occur in an ordinary slight bruise.

Genuine icterus owns many causes, and the pathogenesis is still involved in obscurity. We shall not be far wrong if we associate those cases that recover with the conditions resulting from the change in circulation and respiration at this period of life. We shall see that asphyxia, melæna, hæmatemesis, purpura, sclerema, and œdema neonatorum are massed together as in some way dependent on or associated with feeble vitality and tardy establishment of lung respiration and its consequent circulatory conditions, and I think we shall be wise if we draw icterus—independent of malformation of liver or ducts—into the charmed circle. Hence any circumstance that interferes with the rapid performance of the lung and vessel changes must be regarded as in some degree causes of jaundice. Thus a long labour, premature birth, inherent debility, exposure to cold and damp and impure atmosphere, must be set down as causes.

How to explain the presence of bile in the blood is difficult. I cannot discuss whether jaundice is of blood origin or of liver origin, but I believe that the liver is necessary for the formation of much bile pigment. Doubtless the mechanical theory is in a strong position. Jaundice may result from increased pressure in the portal hepatic system, causing pressure on the

bile ducts; œdema of Glisson's capsule may occur and aid in the compression; or there may be deficient tension in the portal system with overloading of the biliary canals, and the difference in tension may lead to a passage of bile into the blood capillaries in the liver. The liver may swell up from congestion and œdema whenever the right side of the heart is obstructed, and this doubtless may happen at birth, when the lungs do not expand properly. *Duodenal catarrh*, and plugging of the bile ducts with mucus, may conceivably occur soon after birth as the result of a chill or improper food. *Syphilitic growths* may obstruct the bile ducts soon after, if not at birth. *Phlebitis and arteritis* of the umbilical vessels with pyæmia sometimes cause intense jaundice. *Absence or atresia* of the gall bladder and bile ducts, or imperfect development and disposition of the same, is an occasional cause of severe jaundice neonatorum.

I have said enough to show that, however interesting icterus neonatorum may be, we cannot help forward the pathogenesis until we know something more of the nature of jauudice generally.

The **treatment** of jaundice consists in the prevention of its occurrence so far as that is possible by avoiding delay in parturition, by establishing the lung respiration *aussitôt que possible*, by free stimulation to debilitated ones, by placing them in a chamber at a uniform warm temperature, by not exposing them to cold, by not feeding them improperly, and by keeping the air they are to breathe sweet, fresh, but not cold nor too moist. If jaundice has developed, the necessity for the observance of the above commandments of hygiene is quite as imperative. With their observance the treatment of
s comes almost to an end. A simple purge, unless the
syphilitic, is the only drug needed, provided the
ıe fed judiciously. Half-a-teaspoonful of castor oil
amply sufficient. A dose of Hyd. C. Cret. gr. iii. may

be given once with a view to pouring out some bile into the duodenum, and possibly dislodging the plug of thick mucus which may be the cause.

In the **treatment** of jaundice it should not be forgotten that even in incurable cases the intensity of the jaundice varies from time to time. This variation is doubtless due to more rapid elimination at times, and to less rapid formation of bile; partly, perhaps, also, to transformation in the blood by oxidation. At any rate, our cue lies in such physiological speculations. Promotion of excretion by skin and kidneys and lungs, and the maintenance of a good circulation, will effect something, and probably also remove the tendency to the formation of more jaundice. The greatest care is therefore needed not to chill the soft, spongy skin and thus lessen its excretory functions and cause engorgement of the internal viscera. *Frictions* of the whole body with a dry, warm hand may be practised after bidiurnal warm ablutions. The imbibition of a fair amount of fluid would *cæteris paribus* promote excretion by skin and kidneys. A little brandy (ɱx.) given in the mother's milk with a spoon may be very valuable in weakly infants. The child should be kept at the breast if the milk be suitable, as it is much more likely to be than any substitute. Nothing else than filtered water or very thin barley water should be allowed as diluents with the mother's milk. If the jaundice be suspected to be of *syphilitic* origin, the infant may be treated as directed at p. 81. The above-mentioned hygienic measures are of course just as necessary here as elsewhere. Jaundice associated with *pyæmia*, *peritonitis*, *erysipelas*, *phlebitis*, and *arteritis umbilicalis* are desperate cases that require to be treated on the same lines as above mentioned. Stimulants may be more freely given to support strength, and frequently renewed hot moist applications under oil-silk, with glycerine and belladonna may be used for the local inflammations.

ASPHYXIA NEONATORUM.

The affinities of asphyxia neonatorum and atelectasis pulmonum are close. We have to consider simply the respiratory apparatus and the change in its venue at birth. A proper state of the nervous centres, including afferent and efferent stimuli; a perfectly free entry and exit for air into the lungs, or for the blood going to and coming from the placenta; a sound diaphragm unimpeded in its action by any mechanical or other cause—these are the necessities for the establishment of extra-uterine respiration. The child may be born asphyxiated because the uterine circulation has failed either from death or syncope of the mother; because of prolonged excessive contraction of the uterine walls (from injudicious administration of ergot and obstruction to the passage of the fœtus through the pelvis); or from pressure on the umbilical cord. These causes prevent the necessary oxygenation of blood, and the removal of the fœtal waste products. The venosity of the blood excites the respiratory centres to action; the diaphragm descends, but only liquor amnii, or if the membranes be ruptured mucus and air may be drawn into the lungs. Perhaps the respiratory centre is kept from acting during intra-uterine life solely by the efficient oxygenation of the blood going to the brain. The infant may be born partially asphyxiated, in a state of great fulness of the tissues; it may be swollen, hot, and bluish red. Such cases are usually hopeful. But when the infant escapes from the vagina, with a cold shrunken and blue surface, our hope of restoration is slight.

Every care should be taken to see that *no obstruction* exists to the breathing, either in the nose, mouth, throat, larynx and bronchi, or in the abdomen and outside the trunk of the infant. The finger should be wrapped in a soft clean rag,

and introduced into the mouth, so as to clean out anything that may be there. *Turning* the infant upside down will also promote the escape of obstructives. Sometimes the tickling of the fauces may cause vomiting and ejection of mucus and blood from the bronchial tubes.

Peripheral stimulation of respiratory centre.—Dashing a little cold water over the body, or stinging the skin by a flap from the corner of a wet towel, may wake up the dormant respiratory centre. Or a hot bath for a few minutes (100° F.), with a tablespoonful of mustard, may effect this result. If the bath alone be not successful, a dash of cold water as the infant is removed therefrom may prove successful. The inversion of the infant may cause the respiratory centre to act, apparently as the effect of the supply of an increased amount of blood to the head. The faradic current may be applied about the diaphragm and neck, one pole being placed at the back of the neck, and the other moved about the epigastrium and along the path of the vagus. But time must not be lost before carefully and deliberately carried out artificial respiration is commenced. Silvester's method is the best (see an instructive series of papers by Dr. F. H. Champneys, in the "Royal Med. Chi. Trans.") It is important to have the head well retracted, and the chin drawn well up, so as to keep the hyoid bone upwards and support the tongue; or the tongue may be held out of the mouth by a pair of forceps. The movements should be regularly performed sixteen times a minute, the arms being drawn deliberately upwards and outwards, and equally deliberately brought downwards and inwards against the soft walls of the thorax. Perseverance for a long time—half-an-hour—is most requisite. It has been recommended to use Howard's direct method in these cases. In this method the chest is compressed by grasping the lower parts with both hands and then letting go, so that the ribs may suddenly expand and cause a kind

of aspiration-effect on the lungs within. But this direct method is not so efficient as Silvester's or Schulze's swinging movements.

M. Greult has recommended the employment of the hot bath at a temperature of 110° F. It is not likely to do much harm, and certainly seems worth a trial in the cases where the child is collapsed, cold, shrunken and livid.

We cannot tell whether the asphyxia results from extravasation of blood into the brain or meninges. Artificial respiration would be likely to do harm, and so would inversion if this were the case. Bnt obviously the question, though of great pathological interest, cannot have any influence on the treatment, for we do not know why the respiratory centres are paralyzed.

CONGENITAL ATELECTASIS.

At the moment of birth it is necessary that the foramen ovale and the ductus arteriosus should become functionally closed, and the lungs expanded since the place for respiration changes its site from the placenta to the lungs. Asthenia, however induced, or some local condition of the respiratory centres and nerves, or obstruction in the passages, may prevent partially or wholly the accomplishment of this expansion of the lungs. The infant is born with solid lungs, an open foramen ovale, and patent ductus arteriosus; the problem is how to shut the two latter by expanding the former, and opening up the pulmonary arteries. If the respiratory centres or the vagi be damaged, the thing is impossible. If the diaphragm is paralyzed mechanically, or as the result of some imperfection of muscle, likewise the thing is impossible. The costal muscles have but little function at birth. Now the nerves and the muscles may be all right, but the stimulus that sets

them to work may be wanting. The powerful stimulus to the respiratory centres afforded by the deficient oxygenation of the blood is only a proof of the deadness of these centres. Or the respiratory nerves and muscles may only be weak in proportion as the body is weak, and unable to respond to the stimulus that starts efficient respiration. Lastly there may be obstruction to the entry of air by the mouth, nose, larynx, &c. There are all degrees of atelectasis. Indeed, a want of expansion of the middle lobe of the right lung, the languette, and lower margins of the upper lobes, the lower edges and posterior part of the lower lobes, is frequent, probably, in healthy children for a few days after birth.

The symptoms may vary in degree in the same way. A *grave* case is characterized by shallow hurried gasps, cold white surface of body, with blue patches about the mouth, nose, hands and feet, subnormal rectal temperature, remarkable apathy, rapid feeble pulse, inability to suck, feeble cough and no cry, twitchings about the face and limbs. This terminates in death from asphyxia with its customary coma and convulsions.

Physical examination shows that but little air is entering. Breath sounds may have a bronchial quality, and crepitation "compression rhonchus" may be heard. Recession may be seen of the soft parts of the chest wall, which is very flexible in infants. Dulness not absolute, but having a tracheal quality, may be noted over the atelectatic areas.

The **treatment** consists in attending to the respiratory passages, and freeing them from mucus, &c., by wiping out the mouth with soft rag. Obstruction lower down is removed by emetics of sulphate of copper (gr. $\frac{1}{4}$ to ʒi. water) every ten minutes. Emetics are not to be used without consideration. They may produce too much temporary exhaustion. Weak

afferent stimuli may be aided and abetted by a hot mustard (100° F.) bath, a heaped tablespoonful to the gallon, given for five minutes. Respiration is promoted both by flow of blood to the skin and brain, and by the direct stinging effect on the afferent respiratory nerves. *Vomiting* also sends blood to the respiratory centres.

The majority of cases of atelectasis depend on deficient vitality, in which the respiratory neuro-muscular apparatus suffers. Promotion of the health and action of the respiratory neuro-muscular apparatus is aided by placing the infant in the *most favourable surroundings*. The air it refuses to breathe should be at a temperature of 70° F. The mechanical nurse or *couveuse* (Hearson's patent) is an efficient apparatus for keeping the patient warm, a most necessary feature of treatment, which is also conduced to by wrapping every part of its body loosely in cotton wool.

Sucking is impossible in the worst cases, owing to the want of breath and want of muscular strength. Mother's milk, or thin barley with five drops of brandy, may be *dropped* into its mouth, the head being retracted. Or, better, it may be *syringed* neatly into the pharynx. The pharyngeal muscles of deglutition appear sometimes to be too weak to act.

Hot mustard *baths* may be repeated as often as the lividity and apathy seem to be increasing. The respiratory centres may be afferently stimulated by the infriction of turpentine embrocation over the chest and throat.

Important is it to see that the meconium is evacuated, and that no removable mechanical cause of obstruction to diaphragmatic action in the shape of flatulence is present. I have used an injection into the rectum of half-a-dram of turpentine suspended in thin mucilage. This, besides unloading the colon of its wind and meconium, has a general stimulant action.

Rallying of the infant will need great care to prevent its relapsing. Stimulants to respiration must be kept up, likewise the general warmth, and feeding with mother's milk, if possible. The greatest care must be exercised to avoid cold damp air. The air must not only be warm, but free from the effects of overcrowding. Its carbonic acid must not rise above that in fresh air, and the organic emanations from adults should not be allowed to contaminate the air supplied to the infant.

An hour of cold or damp or impure air or an attack of diarrhœa from injudicious dieting, may turn the scale. With these infants to die is easy, but to live is difficult.

UMBILICAL HÆMORRHAGE IN THE NEWLY-BORN.

As in so many other places in the study of the diseases of infancy and childhood, a great deal of mystery is made to hang around the question of umbilical hæmorrhage. For this mystery there is no need. The causes and pathology of hæmorrhage from the umbilicus in childhood are the same as those for any hæmorrhage that occurs from and about vessels ligatured in wounds. Sometimes the ligature slips, and the newly-born bleeds from the vessels in the umbilical cord, or the hæmorrhage may take place after the cord has separated. This may result from imperfection in the healing, changes in the wall of the vessels, or from an alteration in the state of the blood; just in the same way as secondary hæmorrhage occurs in an amputation stump. At times the umbilicus becomes ulcerated, and the vessels participate with the inevitable consequences. Again, the wound may not cicatrise straightway, but there grows up a bunch of granulations which may attain a great size and look like a polyp, and hæmorrhage, not often severe, sometimes comes from these overgrowths of granulation tissue.

Fatal hæmorrhage may be associated with intense jaundice,

the result of the toxæmia dependent on malformation, even absence of the bile-ducts.

Congenital syphilis must be accredited with the power of so deteriorating the blood as to lead to umbilical hæmorrhage. That this hæmorrhage does proceed from altered blood is showed further by the appearance of extravasated blood in other parts of the body, *i.e.*, a symptomatic purpura may be associated with the bleeding from the navel.

I have known the navel to be the seat of polypoid granulations, even as late as the age of three years ; it bled frequently all along, but was rapidly cured by snipping the polypus off at its base with a pair of scissors, and cauterizing with nitric acid the incised surface.

The *prognosis* of umbilical hæmorrhage depends on its cause. Granulations, as a rule, may be quickly healed. Sometimes it is the granulating surface that bleeds, even when the hæmorrhage is indicative of profound disease; then the bleeding has a serious import.

The **treatment** of umbilical hæmorrhage is exceedingly simple, but not always effectual in saving life. Mere pressure with a swab of cotton or lint (old practioners often went for cobwebs and applied this to the bleeding point—I suppose with a view to cause coagulation), or lint soaked with perchloride of iron, often suffices ; but serious hæmorrhage requires no dallying, and nothing short of mechanical obstruction of the arteries should be tried. Two hare-lip pins should be passed through the wall of the abdomen so as to cross the umbilical vessels, then the calibre of the vessels may be occluded by a figure of 8 twisting of silk ligatures about the pins. A paper on the "hæmorrhagic diathesis" in congenital lues, with special reference to the condition of the small vessels, is contributed by Dr. R. Fischl to the "Archiv. für Kinderheilk," Band viii., Heft i. The term "hæmophilia neonatorum" is there used.

PURPURA, HÆMATEMESIS, AND MELÆNA NEONATORUM.

The principal cause of hæmatemesis and melæna neonatorum would appear to be the circulatory disturbance caused by the change in the site of the respiratory area from the placenta to the lungs. In some infants this change appears to take place with difficulty, especially when the congenital atelectatic condition of the lungs is not quickly succeeded by fair expansion of the alveoli. Purpura—hæmorrhages into the skin—may coexist, and epistaxis. Generally the hæmorrhage takes place from capillary vessels, but occasionally actual ulceration, apparently ante-mortem, has been discovered in the stomach and duodenum. Whether hæmophilia, or the tendency which is its chief indication, can be held responsible for many cases of hæmorrhage in the new-born is doubtful, though it perhaps is effective in a few cases. Syphilis must be regarded as a possible cause. The bleeding may occur any time within a few days of birth. Hæmorrhage has been known to occur into the peritoneum, either in combination with hæmorrhage into the alimentary canal or apart from it. Twice a rupture of the spleen with extravasation of blood into the peritoneum has been recorded.

Spurious hæmatemesis is the term employed for vomiting of blood which has descended into the stomach from the infant's nose or mouth. The blood may come from a fissure or ulcer on the mother's nipple, from cutting the infant's frænum linguæ, or from other parts of the mouth, pharynx, and nose.

The **treatment** of genuine melæna and hæmatemesis in the new-born should be of the expectant kind. The infant should be kept at as absolute rest as possible. It has been advised to give gallic acid gr. i., liq. ext. of ergot ♏v. turpentine ♏ii., and other astringents, by the mouth, or by injection into the rectum. Ice bladders have also been recommended and placed over the stomach.

The chief treatment besides rest should be *free stimulation*, and *warmth* to the surface rather than cold. I have seen but one trifling amount of melæna which got well. The infant, a male, the first-born, was brought into the world after a tedious second stage, and did not cry well at birth. Five drops of brandy in the mother's milk every half-hour, and then every hour, were given during the second day after birth, on which the melæna occurred. The stimulants increase the activity of the respiration and circulation, and so bring about the necessary changes more effectually.

TETANUS NEONATORUM.

Tetanus is essentially an excessive discharge from bulbo-spinal centres which Hughlings Jackson says is due to unrestrained cerebellar influence. It is a frequently repeated cord convulsion.

Generally it begins within a week of birth. Difficulty of deglutition is usually the first symptom. Putting the mouth to the breast or bottle induces stiffness of the jaw muscles and orbicularis oris. The whole face may be affected with the tonic spasm, and the spasm may involve all the muscles of the trunk. Cervical opisthotonos is common, but not so total opisthotonos. Asphyxia and cyanosis are not unfrequent. The temperature is usually raised to about 100°, and may be occasionally very high (108°) just before and after death. The spasm does not entirely disappear; the spinal centres give more "tone" to the muscles than they should. An absence of screaming is a noteworthy feature, and so is rapid wasting. The pathology and etiology are very obscure. Umbilical phlebitis and arteritis have been seen in some cases. Probably impure air and defective hygiene, exposure to cold and wet winds, are causes. Falls and blows, mechanical pressure on bulb from displacement of the occipital bone are given as causes. Every sudden change in the environment may induce

a paroxysm. Therefore avoidance of all irritations is necessary—draughts of air, excess of or sudden lighting, loud noises from door slamming or window shutting, sudden movements of bedclothes, sudden approach of persons or food. The whole body surface should be evenly but only sufficiently covered. Bathing is out of the question unless the infant should be kept constantly in the warm bath to ensure absence of irritation. The bowels should be unloaded by an enema of soap and water, with half a dram of castor oil.

Chloral is probably the best sedative and preventive of the spasms. Great care is required in its administration lest it be overdone. It is best to begin with grain doses of the hydrate. It may be given by the mouth if deglutition is not affected, or by the rectum, or better still, by the nasal gastric tube with the food. When the spasm affects the pharynx and? gullet, feeding with the soft nasal catheter is imperative. It should be done systematically and with chloroform, so as to prevent paroxysms being produced by the nasal irritation. The chloral may be given with some of the mother's milk, or thin barley water, mutton broth, or whey mixed with ten drops of brandy.

Extract of calabar bean (gr. $_1\frac{1}{2}$) by the mouth, or gr. $_2\frac{1}{10}$ under the skin, has been highly recommended. It should be pushed with carefulness to the point of lowering of the pulse rate and breathing.

Preventive and other hygienic management of the infant and mother should consist in the avoidance of falls and blows, of prolonged labour, of dirt and irritation of the navel-string, of uncleanliness of bed, bedding, and clothing, of over-crowding and impurity of atmosphere or room, and of wet and cold.

The occipital and other bones should be searched for indentations resulting from mechanical pressure during parturition, or from blows and falls. The displacement is said to occur also after birth from pressure by anything on the occiput. If

a dent be found, the head must be specially protected from injury or sudden movement, and the infant should lie on its *side* and not on its back when the occipital bone is staved in. Some authors even go the length of recommending surgical manipulation, but any degree of force should surely be avoided. Leeches have been applied to the nucha and along the spine, and the spinal ice-bag has been recommended.

Opium, ether, belladonna, aconite, cannabis indica—half-an-ounce of tincture in one day has been given, conium, curare, tobacco, and assafœtida have been recommended or tried.

SCLEREMA AND ŒDEMA NEONATORUM.

This disease is characterized by the development of hard patches in the true skin. The patches spread in such a manner as to involve large tracts of skin, and, indeed, may form a plastron all over the trunk. The shoulders and buttocks may be also affected. The colour of this rigid skin is bluish red. A fold of skin cannot be picked up between the fingers owing to the rigidity and thickening.

Sclerema of the true variety is seen in the first few days of life. A great deal is made of the debility of the circulatory and respiratory organs. Most of the cases prove fatal in a few days or weeks. I have seen two cases. I also saw a case shown by Dr. Barlow to the Clinical Society; this child never seemed particularly weak either about the heart or lungs, and after being treated for some months it gradually lost nearly all traces of induration, and appeared bright and cheerful. Atelectasis is often found after death; it probably develops slowly during the brief life of the infant. Parrot has observed sclerema in cases of rapid athrepsia. We do not observe this in England. The temperature of sclerematous cases is usually low. It was 90 in the rectum in one of my cases.

Œdema of the subcutaneous tissues is described by

Parrot. I do not remember to have seen a pure case. It is closely allied in its clinical relations with sclerema. Atelectasis is often congenital in it; the children are usually premature and feeble. The œdema commences a day or two after birth, and generally spreads from below upwards. Firm pressure may leave a pitting; the colour of the surface is not bluish red. In both these diseases, which may coexist, feeble vitality is a great feature, as a rule. Convulsions, diarrhœa, syncope or asphyxia may close the scene.

The **treatment** of both diseases consists in wrapping the infants up in cotton wool, and placing them in a warm place; the mechanical nurse or *couveuse* would prove excellent. Five-drop doses of brandy, repeated according to circumstances, may be given in a little barley water or veal tea or whey if debility be great. Aromatic waters promote digestion. The infants may be unable to suck, and then the food should be syringed into the back of the mouth by means of a short piece of tubing. Dr. Barlow and I have employed inunctions of camphorated oil in cases of recovery. Small doses of cod-liver oil were also given. And this treatment should be repeated in other cases. Indeed, a kind of massage with stimulant oils may well be tried. The hard œdema sometimes seen in the feet of cases of infantile palsy is forcibly recalled to my mind in connection with the sclerema and œdema of the newly-born. *Warmth* is regarded as curative—*hot baths, vapour baths*, and *frictions* with warm oil. *Hot sand* or *bran bags* may be applied to the surface.

ERYSIPELAS.

Henoch describes erysipelas amongst the diseases of the newly-born. In this he is right, for the disease chiefly occurs within a few months of birth, and is then very severe—mostly fatal. It occasionally occurs after the first year of life. In its general characters it does not differ

from the disease in the adult, but the face is far less frequently affected. As in the adult, a wound or cutaneous lesion generally exists, and is the starting point; hence, eczema of the head and genitals is a common place for its commencement. It is essentially a disease of faulty hygiene. The larynx may be involved by extension from the neck or from the rhinitis and sore places about the nostrils. The disease is severe, with high fever (105 or more) and brawny swelling of skin. The feeble vitality of infants proves unequal to the erysipelatous process.

The only **treatment** should be a stimulant one, and instant removal to the country if possible. Peritonitis is very frequent, but its signs may be masked by the general disease. Suddenly-developed tympanites is its most important manifestation. Pneumonia, pleurisy, enteritis, and gastro-enteritis may occur. Spread of disease is far greater and easier in children, hence these inflammations. *Stimulants:* Brandy and wine are needed; ten drops of brandy in equal parts of barley water and milk, or wine whey, may be required every hour. Ammonia may be given alternately with the alcoholic stimulant—mxx. of sal volatile in milk and water; the mother's milk is the best. As to local treatment, the great point appears to be protecting the inflammation from the air and light; painting the red surface with glycerine of belladonna, and covering over with lint or warm fomentation, is good. Many topical remedies are advocated, but anything that fulfils the above requirements will do; white lead paint answers the purposes well. In children above six months, tincture of iron perchloride in three to five-minim doses, with 20 drops of glycerine to ʒi. of water, may be given. Iron is useless, in my opinion, for the erysipelas of the newly-born. Hot fomentations or light linseed poultices may be applied over the abdomen or chest when these are the seats of secondary inflammations. *Constipation* is best treated by enemata, if at

all obstinate. Avoid any but mild laxatives. In the early stage a small dose of castor-oil is valuable. *Diarrhœa* is rare, but not difficult to treat.

Blisters to the spreading part or in front of it, mercurial ointments, baths of corrosive sublimate, and actual methodical compression have no checking influence.

Compresses of lint wrung out of camphorated spirit, fomentations with lead water, poppy fomentations, and poultices are useful local applications.

A favourable turn and subsidence of erysipelas indicates free *stimulation* still with ammonia, and bark, and brandy. Quinine may replace the bark, and 15 minims of tinct. quinæ ammoniata may be prescribed every hour, or less frequently. *Abscesses* should be opened at once, carefully and antiseptically. A dram of glycerine to ʒi. of fresh cold cream is a favourite anointment of Meigs and Pepper. It is smeared over the inflamed surface several times a day. Cool or tepid emollient applications (linseed tea or barley water) may be used at the same time.

Tumour of the sternomastoid generally occurs on one side, and is mostly the result of abnormal or prolonged parturition in which the muscle becomes ruptured and a hæmatoma forms within the sheath. Torticollis may result. But some cases at least recover without deformity. Whether syphilis has anything to say in the causation is doubtful; but a syphilitic infant may have the tumour as well as another. Infriction of simple oil with the finger, cold compresses, or doing nothing is the usual treatment.

Pemphigus neonatorum is treated of under syphilis, which is its most frequent cause. Other cases occur apparently not specific and more amenable to treatment, which should be hygienic and dietetic as well as medicinal. The palms and soles are said not to be affected in this simple variety.

CHAPTER IX.

CONGENITAL HEART DISEASE: MORBUS CÆRULEUS.

THE cardinal symptoms of congenital heart disease, one or more of which may be absent, are: *cyanosis, cardiac murmur, clubbing of fingers and toes.* *Nævoid* conditions of the cutaneous veins of the left eyelid, and of the retinal veins on both sides, have I seen in a typical congenital case. The liabilities of the disease *quâ* symptoms are paroxysms of dyspnœa, of palpitation, of convulsions, of diabolical screaming, of stupor or drowsiness, of epistaxis, and other hæmorrhages.

The nature of the malformation or disease can only be guessed at. The commonest lesion is obstruction at the pulmonary artery, with dilated and hypertrophied right ventricle, patent foramen ovale, and incomplete ventricular septum. The blueness of nose, mouth, ears, toes, and fingers is *not necessarily* attended with coldness of these parts. The temperature of the body is mostly normal. The blueness may not be manifested till some days, weeks, or months after birth. Many cases die before the end of the second year, but few reach 30 years of age.

The *preventive and hygienic treatment* of cases of congenital heart disease is the most important. The avoidance of great muscular exercise and of mental or nervous excitement will do something to stave off the attacks of dyspnœa, palpitation, screaming, and convulsions. The avoidance of cold and damp by the employment of uniform woollen clothing to protect all parts evenly will prevent pulmonary and intestinal catarrh, and so lessen the tendency to further deoxygenation

of the total bulk of blood and further loss of vitality. The avoidance of indigestible articles of diet, and of other causes that promote indigestion, will ward off the stupor or drowsiness that is a frequent symptom. Excess of sugars and starches, as preventive of acidity and intestinal catarrh, should be avoided. The food must be of a nourishing sort, and if necessary the appetite should be improved, and digestion aided by alkalies, bitters, and tonics. If the attacks of dyspnœa, &c., should come on they are to be treated with simple stimulants like brandy, ammonia, and ether. They may often be best relieved by an emetic, and the bowels should be freely opened with castor oil. I usually prescribe occasional doses of gray powder to relieve hepatic congestion. Saline purgatives in the usual doses are also valuable. Digitalis is occasionally useful, but not very, probably because the hypertrophy does not affect the left ventricle, on which digitalis probably has more action than on the right ventricle. Cinchona or quinine may also be prescribed—three minims of the liquid extract or a grain of the sulphate with glycerine. What has been said of the benefit of fresh seaside air applies to children with congenital or other heart disease. Cod-liver oil I always prescribe in these cases with a view to promote nutrition; the growth of the body being nearly always retarded. Care should be taken that the prolonged sitting in one posture does not cause congestion, œdema, and coldness of extremities. The perambulator should be well cushioned and the limbs evenly covered when the infant is taken out of doors. The skin requires careful cleansing, and should be kept thoroughly acting by frictions, as it tends to become dry except in the palms of the hands and soles of the feet. But little can be done for albuminuria should it supervene. It results from the venous congestion. The skin and kidneys should be kept acting by demulcent drinks of thin barley water, and if necessary hot air

baths. The bowels will need more careful attention. Diuretics are useless unless it be digitalis, which seldom relieves albuminuria. Sir W. Foster has recommended eight-minim doses of peroxide of hydrogen three times a day as useful to remove extreme cyanosis. Dr. Eustace Smith advises small doses of infusion of digitalis for violent palpitations, and the late Dr. Peacock employed small doses of Dover's powder, which also tend to moisten the skin. Paroxysms of passion—mental epilepsy, are common; they should be guarded against for they often cause great exhaustion. A form of spurious cyanosis may be seen in young infants, due to the absorption of aniline dyes from newly-marked napkins.

ACQUIRED HEART DISEASE.

It is impossible to separate the discussion of infantile pericarditis and endocarditis from rheumatism and its allies. What has been written on rheumatism might equally well have been introduced here. The necessity for daily supervision of the heart by auscultation when the child is laid up with an obscure illness of doubtful rheumatoid nature is of the very first importance.

Scarlet fever, measles, and diphtheria are other blood diseases which may give rise to pericarditis or endocarditis, and with descending frequency in the order mentioned. Pericarditis may complicate pleurisy or peritonitis or meningitis. In infants suffering from erysipelas pericarditis may arise, but be difficult of detection. This is an illustration of a canon of infantile pathology which teaches that the perfect diagnosis of disease, always more difficult in children than adults, is far more so the younger the child.

The *symptoms* of pericarditis and endocarditis may be latent, or there may be disturbance of pulse and respiration and even cerebral symptoms, with pains about the præcordia, but there is very little that is special to children beyond what

has been indicated here and under Rheumatism. The great frequency of endocarditis in rheumatism in children is partly compensated for by the greater frequency and proneness for cardiac lesions to disappear at this period of life, and also by the greater and ever remarkable powers of compensation possessed by the myocardium. The tendency for valvular lesions and their attendant murmurs to disappear should, I think, be thought of as part of the same general law by which rheumatic phenomena generally are governed; the arthritic manifestations, the nodules of connective tissue, the erythemata, the chorea, all have a special tendency to disappear and alas! also to return at uncertain periods. Truly there must be a rheumatic diathesis whose manifestations are for the most part suppressed in the life of the individual, in whom frequent explosions occur, sometimes apparently spontaneously, and at other times on the slightest exciting cause, and these explosions are sometimes obscurely connected with one another by smouldering remissive manifestations.

Some of the severest forms of heart disease in children are attended with the persistence of subcutaneous nodules, and in some measure the state of the subcutaneous beads is a guide to the state of their valvular homologues. I say in some measure, because the local causes that maintain nodules about the elbows are perhaps at times more powerful than those that maintain their valvular companions. The wasting and cachexia, with severe præcordial or epigastric pain that accompany the severe form of heart disease in childhood, deserves special notice. In these cases the dyspnœa often amounts to orthopnœa. Hæmoptysis, cyanosis, clubbing of fingers, pleurisy, bronchitis, albuminuria, dropsy, ascites, adherent pericardium, dilatation and hypertrophy, with affections of valves on both sides of the heart, may all be observed in the course of one and the same case.

The **treatment** of *acute pericarditis* and *endocarditis* is the

treatment adopted in rheumatism and other diseases which the cardiac affections complicate. The child should be kept lying down in the recumbent position if there be no increase in dyspnœa thereby. The recumbent position gives the heart least work to do, but simple perfect rest in any position is the most important indication in treatment, the object being not to excite the myocardium to make an effort in excess of the requirements of the circulation, and also to prevent the occurrence of acute dilatation of the myocardium. This leads up to the question of how much force is necessary to maintain a flow of blood throughout the vascular system. The answer to the question will depend largely on the arterial blood pressure which is a measure of the resistance chiefly in the capillaries to the flow of blood from the arteries to the veins. It would seem desirable, therefore, to use remedies calculated to diminish vascular tension.

In *pericarditis*, more than in endocarditis the action of the heart is very frequent, and this it would seem to be necessary to control; but I cannot bring myself to think that any cardiac drugs should be employed to effect any depressant action. Sudden dilatation ever haunts one, so that I do not advise the use of aconite, antimony, or tartar emetic in children. I prefer to trust to rest in bed, to low diet in the form of weak milk and water and barley water, mutton broth, and the like. The bowels, skin and kidneys should act thoroughly, so that the blood may be kept as pure as possible, and any heightening of arterial tension that may be due to impurity of blood be thereby avoided. In cases of great restlessness, provided the bronchial tubes are not clogged, and there be not a marked degree of cyanosis, opium may be useful both in quieting the heart, calming the nervous system, moistening the skin, and lowering the blood pressure. It may be given as Dover's powder gr. iii., or chlorodyne ♏iii. three or four times a day for a child seven years old.

Belladonna tincture ɱx., or drop doses of liquor atropiæ, may be used when the bronchi are clogged; and chloral may be employed cautiously. Bromides of ammonium or sodium are better than that of potassium.

At the same time that a *low diet* is maintained it may be necessary to administer small quantities of *brandy*. The pulse and first sound of the heart should be watched narrowly for indications of asthenia. I never use mercury or venæsection. But a couple of leeches over the præcordial region may be employed at the outset of pericarditis, no matter what its origin, provided there be not a great anæmia. The best local application is well-made linseed poultices, changed every hour, and covering a large extent of the front of the chest and left side. Every care must be taken to prevent the surface from being chilled during their removal and application, and it is advisable with this end in view to oil the skin well, and also to have a layer of cotton wool in readiness.

I have no experience of *cold, wet compresses* in pericarditis, but should not condemn them, as I have seen them used with apparent success in localized pleurisy. *Spongiopiline* heated by hot water or in the oven is a favourite local application with some. It is rare that an effusion remains unabsorbed. Should this prove the case it is advisable to confine the patient to bed, even though there be no fever and no disturbance in any other part of the body. The amount of fluid taken in the twenty-four hours should be restricted, and iodide of sodium should be prescribed in large doses, commencing with small ones of two grains three times a day for a child six years old. Then the surface of the præcordia may be *counter-irritated* by iodine tincture or liniment, or by the oleate of mercury, which I used successfully in one case in which the effusion hung fire for a few weeks. I have not used blisters here, but they are commended. It is well to combine some tartrate of iron (gr. iii.) with the iodide so as to improve the condition of the

blood, which often is a cause of the continuance of effusion. If the heart be impeded in its action two drops of (and gradually increased) tincture of digitalis may be prescribed, and this often acts as a diuretic and indirectly promotes the absorption of the effusion.

Care should be taken in cases of this kind not to shift the patient's position suddenly, lest the sudden movement lead to syncope from sudden myocardial dilatation. Brandy and ammonia may be needed, especially in the early hours of the morning, and a nourishing diet is generally required—strong beef tea, minced under-done meat, custards, and good milk. It is possible that *paracentesis* may be required for the removal of serous pericardial effusion. In purulent pericarditis such treatment has been occasionally successful. The exploring syringe should be used first, and with great care. The puncture is best made in the fifth left interspace, one inch from the sternal border. Of course this will not be done without due deliberation and consultation. Rosenstein used the method in a boy aged 10. Skilled surgical aid should be sought.

I do not know of any certain means of diagnosing *adherent pericardium* in the child, but the severe dragging pain about the *epigastrium* is, I believe, very suggestive of this lesion.

Of tremendous importance is the management of *convalescence* from endocarditis and pericarditis. *The myocardium is the centre of attraction.* How to keep its muscle and nerves in good condition whilst the pericardium and endocardium are being themselves restored by the vis medicatrix naturæ as well as by the physician's art.

Rest in bed should be insisted on with religious fervour. It is easy to divert children in confinement. Disease of the hip joint has often confined children to their cots for months and years at a stretch, and this in a recumbent, constant, dorsal decubitus. Is not a heart of more importance than a hip?

All excitement should be avoided. Romping is radically wrong. Sleep should be sedulously sought every night, and for as much of the day as possible. With a physiological paralysis of mind or cerebral cortex the heart does not bound or leap in harmony with changes in the environment. Though palpitation from indigestion is more unrestrained during sleep, yet the latter is often prevented by the former.

Rest for the myocardium is also promoted by general tonics and general sedatives, as well as by heart tonics and sedatives. These may, however, be considered in conjunction with the treatment of chronic heart disease.

The management of *convalescent and chronic valvular* disease of the heart is a very interesting practical study. The *great essential is to maintain the nutrition* of the *myocardium*. This will include not only the regulation of the diet by which body and heart muscle are nourished, but will comprise also the adoption of all those measures of preventing the occurrence of any accident, however small, calculated to deteriorate either the general health or the health of any organ on which the collective health depends. We have had to repeat the conditions of hygiology almost to the sickening point, but we must rise once again in this connection, and insist on the necessity of fresh air, with avoidance of cold, damp, and impurity; of warm uniform woollen clothing, with special attention to the state of the hands and feet, neck and chest; of gentle exercise, as in quiet walking; of attention to the appetite, digestion, sleep, and the state of the excretory organs, skin, liver, kidneys and bowels. The special condition of cardiac hygiology is, however, the avoidance of any action—nervous, muscular, or glandular—calculated to excite or depress the contraction of the myocardium. A full meal embarrasses heart and lungs, and tells thereby doubly on the right ventricle. Running, walking upstairs, sudden shocks as from receipt of bad news, practical joking, playing excitedly

or dramatically, witnessing sensational or tragical p
sometimes too much, the heart muscle. If the child
specially emotional sort it is advisable to let his tra
education be accomplished privately, for outburst
from jealousy, attempts at competition either in
study or examinations, angry emotions, frights
disturbances, are all inseparable from the life of a
boarding or day school.

Of *bathing* it must be said that swimming should
only when the lesion has been long at a standst
fresh hypertrophy has occurred for years. It i
interdict all forms of swimming, as it is to disall
cricket, fives, hockey, and football. But each c
be studied in these respects on its own feature
heart has been in an absolutely stationary state
time a moderate indulgence in swimming, cr
hockey or fives may be allowed, but not the viol
Any special training should not be permitted. B
bathing may be practised with the provisions that th
not too great and the child has not been recently suf
want of cardiac compensation. It is very necessary
the fact that cardiac disturbances may arise from ca
the organism ; the causes just mentioned are more
understood by parents and lay people generally. R
being the chief cause of heart disease, must be a
only by preventive means against the environm
the avoidance of too much meat, eggs, too muc
starchy food ; for indigestion or overloading of the
the products of digestion is a sure basis for rheum
gout.

Any sign of *want of compensation* of the heart
cough, dyspnœa, hæmoptysis, paroxysmal or conti
tation, indigestion, sleeplessness, emaciation, œde
and the like—should be promptly met by placing

bed for one or more weeks, and treating him or her medicinally and dietetically. The food should be light and nourishing—milk, a little white fish, bacon, custards, bread.

Iron and digitalis are the two best remedies. The pernitrate of iron or perchloride in five-minim doses, with three-minim doses of the tincture of digitalis and half-a-dram of glycerine in a tablespoonful of water, may be given to a child seven years old, but other preparations of iron may be better borne, and infusion of digitalis in half-dram doses may effect better results. Sometimes it answers best to give an extra dose of digitalis in the early hours of the morning, when children often wake somewhat faint when suffering from heart disease.

If there be anæmia I counsel the employment of the sitting or recumbent posture; the child may go out in fine weather in a carriage (see chapter on Anæmia).

Bronchitis (see p. 172) and indigestion (see p. 35) are treated as they would be elsewhere, care being taken not to employ measures that tend to depress the myocardium.

Excessive hypertrophy should not be treated by cardiac depressants, aconite, antimony, veratrium. I feel most strongly on this point. The cause of the hypertrophy may be found in a diseased kidney, the treatment should be directed accordingly. Conceivably hepatic and gastro-intestinal or nervous derangement may have something to say in the causation of the hypertrophy. The indications for the employment of digitalis are the same as in adults—irregularity, frequency, intermittency, smallness of pulse. But digitalis is more generally effective in relieving heart symptoms in the child, and the improvement is often persistent after a course of a month or two of digitaline treatment. Besides special cardiac stimulants ordinary stimulants may be needed in the course of a case that steadily progresses down hill, and when the *pericardium is adherent*, digitalis, in severe

heart disease, with smouldering rheumatism, often proves of no value. Then ammonia and brandy should be freely given to ward off syncope, which may have to be met by the subcutaneous injection of ether ♏x. or more for a child seven years old.

Attacks of *palpitation* generally call for attention to the hygiology of the nervous system and digestive apparatus. They may be traced to excessive reading and head work, or to constipation and indigestible articles of diet. For their immediate relief diffusible stimuli should be given, as in congenital heart disease.

Dropsy in the child is treated on the same principles as in adults. The best diuretics are digitalis, fresh infusion in dram doses, squills, gin or juniper, and the ammonic and potassic acetates. The "dropsy" pill, composed of one grain of blue pill or calomel, ½ grain of powder of squills, and ¼ grain of digitalis powder, has been effective in removing with astonishing rapidity ascites and anasarca in children. I learnt the practice from Dr. Dickinson. Citrate of *caffeine* I have also used with excellent effect in one-grain doses rapidly pushed, every three or four hours. Resin of *copaiva* in ten-grain doses in Mist. Amygdalæ Co. is also a diuretic of good value in some cases with much bronchorrhœa and cough. The above doses are all for children about six years old. It is customary to "dry cup" and foment the loins when diuretics are being given. Dr. Eustace Smith highly commends ten-minim doses of tinct. of *cantharides* for a boy nine years old, three times a day.

Elaterium, though not always a reliable preparation, is a very good hydragogue cathartic in children about the age of seven; it may be given in $\frac{1}{20}$-grain doses with sugar of milk. Pulv. Jalapæ. Co. (gr. x.) is, however, an equally efficient and safer watery purgative for children generally.

I have occasionally used *punctures* about the ankles to

relieve dropsy in the legs. The legs should be in a dependent posture; the punctures should be made with strictly *aseptic* instruments, and antiseptic precautions adopted in the form of hot fomentations wrung out of boiling water impregnated with carbolic acid, 1 to 40, or perhaps better still boracic acid. Southey's tubes have also been employed.

Whether there are remedies calculated to *remove the fibroid lesions of the valves* need not be here discussed, and beyond the prevention of rheumatism, and the treatment of it when it arises, I should be content to trust to general measures as above indicated rather than employ such drugs as iodides, or bromides, or mercurials (which may develop anæmia), given with a view to promote the return of the valves to health.

CHAPTER X.

DISEASES OF THE SKIN.

The skin of children is a very sensitive structure. exercise cause it to swell up and stretch very muc the skin of adults. Hence there is a greater dang ing cold from overheating. The large surfac vessels presented to the action of cold is one of t children's susceptibility to chills. The application causes greater shrinking of the more elastic skin relative emptying of cutaneous blood-vessels. T sympathises with other organs, especially kidneys bowels, and perhaps in greater degree than in adul alimentation is a great cause of skin disease Therefore it is most necessary to inquire caref nutely into their dietary. Local irritants of any greater effects in infants and children than in the napkins must not be washed in soda, and they sho for hours in weak Condy's fluid, then rinsed in prevent pigmentation before being washed.

Hot bottles, blisters, hot applications and b things to be very carefully applied, in view of the the infant's skin. A urinous napkin may cau tion, even ulceration, of the bottom. The s cleaned regularly, at least once a day, wi water, in health. Actual cold water for young i be avoided; it should not be lower in temperatu The skin should always be thought of as organ, which also serves an essential part in ma normal temperature of the body. It should b

where uniformly warm, and not be covered with impervious articles of clothing. All clothes should be porous. Jæger's system of woollen clothing is good. Combination garments are better than separate coverings for different parts. A child's feet and hands should never feel cold. If they do measures should be taken to prevent it.

Nits in the hair are common in the debilitated children, chiefly of the female sex. The hair should be cut until it is one inch long or short. Then the head must be thoroughly soaped with soft-soap and cleaned. It should be combed with a tooth-comb twice a day, dipping the comb into a basin of spirits of turpentine. Methylated spirit also dissolves the nits off the hair. Cod-liver oil, iron wine, and quinine should be given, and fresh air, good food and cleanliness of body also supplied.

Pediculi must be treated on the same lines. All the linen and clothing should be baked in a disinfecting chamber.

Strophulus, or **red gum,** is a minute papular rash, very common in infants, as the result of local irritation from flannels, sweat, &c. It may occur, also, as the result of faulty digestion and feeding. So-called strophulus albidus is believed to be due to distension of sebaceous glands, but this view is not accepted by everyone. Attention to the infant's dietary in accordance with rules laid down elsewhere, and the employment of a little rhubarb and soda mixture, with the local application of calamine lotion, and the removal of all sources of irritation, is the treatment.

Psoriasis guttata occurs in children, but the amount of silvery scales is often slight on the little red raised spots which are scattered about the trunks and limbs, chiefly on the extensor surfaces, but not thickly anywhere. It is not nearly so obstinate a disease as psoriasis in the adult. Careful attention to the personal hygiene, and to that of the environment, with good food, cod-liver oil, and iron, are

important measures. Arsenic is useful, but not s
when the epithelial scales are very abundant. Q
be given with the iron. I always try the chrysop
gr. x. to ℥i. of geoline or lard locally, warning t
that dusky redness may spread away from the sit
plication. It is advisable to apply it first only to
A mild mercurial ointment—white precipitate g
lard or geoline; or nitrate of mercury gr. xx., o
℥i., lard ℥i.—may be used.

Other, more obstinate, forms of psoriasis,
hyperæmia, do occasionally occur in children,
alkaline baths, inunction of simple oil, and when
has subsided a tarry ointment—Tar. ℥i., cam
lard ℥i. Traumaticine (purified gutta-percha o
solved in ten parts of chloroform) forms a softer
film than gelatine or collodion (Malcolm Mor
neither tension nor pain. Auspitz treats psoriasi
per-cent. solution of chrysarobin in traumaticine
are first removed by soap and water, and the s
painted on the affected parts with a thin, sho
brush. Universal psoriasis in a child eight y
treated successfully by Dr. Fox, of New York,
per-cent solution of salicylic acid in castor oil.
made of copal dissolved in turpentine is a new
varnish.

Pityriasis rubra occurs in children. I have
The whole body was very red, and coated wi
patches of whitish epithelium; the scalp also
The desquamation should be aided by alkaline
carbonate of soda to two gallons of warm wate
surface should be anointed with neat's-foot or ol
diet must be regulated. The patient should be
first. Cod-liver oil should be prescribed, and qu
doses with 20 drops of glycerine. I think it hi

get the child to drink as much barley water or other bland fluid as possible. Tincture of perchloride of iron may be prescribed when the hyperæmia has subsided and convalescence is approaching (T. and C. Fox).

Herpes zoster is not an uncommon affection in children. I have noticed it five times in children who had hooping cough. It does not give rise to pain, and is not usually followed by the severe pain that characterises the affection in the adult. Great care should be taken that the vesicles are not irritated, as troublesome progressive ulceration may occur. Scratching must be strictly prevented. I prefer simply to cover the part up with salicylic wool. No washing of the part should be done. A little powdered starch or oxide of zinc may be sprinkled over the vesiculate areas. Some use cold emollient lotions, such as mucilage, barley water, with which to bathe the parts. It is advisable to give a little quinine in gr. i. doses, with glycerine t.d.s., or in granules, for a child six years old.

The general health requires attention. The regimen must be regulated to suit the digestive powers. As a rule, nothing else is necessary. Constipation is relieved by fluid magnesia or castor oil, confection of senna and sulphur, and syrup of rhubarb. A loaded tongue and sallow face, foul breath, and clayey stools should be treated by a dose or two of mercury and chalk, gr. iii., with rhubarb and soda gr. v.; two or three granules containing these, or a capsule enclosing them; and a saline purge. Repeated powerful purgatives should never be employed for fear of setting up intestinal catarrh.

Pemphigus may occur in the acute as well as in the chronic form in children. The former attacks debilitated children, and especially therefore those that have been reduced in vitality by the acute specific fevers. The eruption consists of bullæ or large vesicles, which at first contain translucent fluid which becomes opaque; the bulla shrinks and dries up, leav-

ing a scab. The chronic form may continue its ex
months by continuous crops of bullæ, or it may c
single bulla (p. solitarius).

The attention should be directed towards imp
hygiene of the person and of the environment.
should be taken to put the patient in the way o
those conditions essential to healthy existenc
measures alone will do a great deal to remov
form. For the chronic variety, as for the acute
regarded as the remedy *par excellence*. It may
three-minim doses to a child five years old, and ir
ferri. Quinine in gr. i. doses three times a day
administered if the child have come from tropical
parts. Sometimes the acute eruption causes mu
tional irritation and distress, which are best relieve
(chlorodyne ɱv. for a child six years old). The
of opium also act as curative agents in this for
local sores clean aseptic lint should be used to ke
free from irritation. Scratching or the introduc
must be guarded against. In the debilitated
ulceration and even gangrenous changes, may oc
standing the adoption of every local precaution.
lotion is one of lead, or an ointment of the same.

℞ Solution of Subacetate of Lead, ʒii.
Vaseline, ℥i.

Zinc ointment may be used instead.

Scleroderma occurs in children some years ol
gether different from the sclerema neonatorum, a
the scleroderma of the adult. The colour of th
induration is often like that of the healthy skin,
bluish red as in the disease of the newly-born.
a tallowy white tint. Its causes and treatment
understood. It does not appear to be related to an
to be associated with any disease of the inte

Some cases gradually disappear under no other treatment than friction of the hard patches with oil of any kind, and the administration of quinine and other tonics.

A false variety of sclerema of the adipose tissue not unfrequently occurs in fat infants. It is really the result of deficient warmth. The fat of infants does not melt at the ordinary temperature of the body, and so appears harder than it should, especially when the infant's temperature is lowered at the surface of the body from any cause.

Alopecia areata, which is generally conceded to be a non-parasitic disease, occurs not unfrequently in boys and girls about the age of six, or the period of second dentition. The hair is lost in circular patches, which spread rapidly, and may lead to total alopecia. It is probably due to derangement of trophic nervous influences. The hair, as a rule, tends to grow again after a time. Its first reappearance is in the form of fine downy hairs, with little or no pigment. The process of reappearance is hastened by the internal administration of tonics, of cod-liver oil and iron, and by attention to the personal hygiene and to that of the environment. It is well for the children to leave off schooling for a time, and to spend more of their energy by way of the muscular apparatus, rather than by the over use of the growing cerebral cortex.

Ointments of salicylic acid are good as stimulants, and also as antiseptics. The corrosive sublimate ointment, gr. ii. to ʒi. lard, or a lotion containing cantharides or iodine, may be employed.

℞ Tinct. Canthar., ʒi.
Aceti. Distill., ʒiss.
Glyc., ʒiss.
Spirit. Rosmarini, ʒiss.
Aq. Rosæ., ʒviii.

sponged with care on to the scalp two or three times a day.

Arsenic, in two-minim doses of Fowler's solu
steel wine, may be prescribed. Erasmus Wilson's

R Ol. Amygd. dul. } aa. ℥i.
Liq. Ammoniæ. }
Spt. Rosmarini. } aa. ℥iii.
Aquæ. }

is a good stimulant to the bald patches.

SCABIES.

In examining the skin of infants, it is well alwa
of syphilis and scabies. And if the eruption be i
of the hand, or soles of the feet these are almo
causes. In the dirty and neglected, or in the
the itch may cause severe lesions of pustular ki
the well-tended skin of healthy children only
urticaria or vesicles may be excited by the insect
the itch occurs mostly about the buttocks and fee
much pruritus, which is worse at night or when t
kept warm. The tortuous furrow or cuniculus
diagnostic, but this appearance is often mas
inflammation excited by scratching. If fortun
tioner may turn the insect out of its burrow with
a needle. The treatment consists in the destructio
insect by means of some parasiticide.

The practitioner should advise the whole of th
ments of the child to be baked in the *disinfecti*
the under-linen may be boiled.

The best way to attack the insect in the skin
hot bath, in which the patient should be kep
minutes at least. The object of this is to soften
the cuticle, especially where it has been furr
insect or raised into vesicles by the irritant
parasite. Soft soap may be used to the ski
Wright's coal tar soap. This soaping and hot

well done. Its object is to lay bare the whole of the furrows, and probably the procedure in itself dislodges the acarus scabiei. Next dry the infant all over thoroughly, and then proceed to rub in the sulphur ointment—ʒi. of precipitated sulphur to ℥ii. of lard. Oil of sulphur is very good—ʒiiss. of the precipitated sulphur to ℥i. of olive oil. The procedure is not a mere laying the ointment on; it is a matter of infriction and inunction, and must be done most thoroughly. There is no need for a repetition of this treatment.

Another ointment that may be used is sublimed sulphur, ʒss.; ammoniated mercury, gr. v.; creasote, ♏iv.; olive oil, ʒii.; fresh lard, ℥i. But I mostly use now the balsam of Peru. ʒi. or ʒii. to ℥i. of vaseline or geoline. Should there be scabs and pustules, the crusts and matter must be carefully removed by sweet oil or carbolic oil. Then when the raw surface is exposed the ointment should be applied to it, spread fairly thickly on clean aseptic lint.

In young children the caution not to overdo the sulphur inunctions is very necessary, for a crop of cutaneous lesions is sometimes caused by this excess of zeal. The Peruvian ointment has not this objection. Storax ointment (liquid storax ℥ss., lard ʒi.) is preferred by some for obstinate cases. Iodide of potassium ointment is also efficacious. If there be much heat and tenderness soothing lotions may be used thus:—Calamine powder, ʒi.; oxide of zinc, ʒi.; glycerine, ʒss.; rose water, ʒx.

RINGWORM.

Tinea tonsurans is most contagious, and every care should be taken to keep the children from mixing together or using one another's caps and other garments. Neither the bed-linen nor the towels or combs and brushes, or other articles of toilette should be used in common. It is one of the commonest diseases of the children's scalp. In typical cases the circular

patches on which broken, brittle, twisted, dull, lus
are seated are sufficiently diagnostic. But the
should always be used, and the conidia or refracti
spores may be readily discovered if a diseased hair
liquor potassæ. The typical appearances are ofte
the production of vesicles or pustules and conseque
This is prone to occur in the poor and in the negl
result of local irritation and want of good food a
same may happen in the scrofulous, even when
owing to their feebler vitality. Tinea circinata is
the same parasite when working on the non-hairy
earliest indications of the action of the trichopl
scalp is a circular patch with scales, and the h
are brittle and somewhat dull-looking.

A parasiticide is the essential feature in the **tre**
there are certain precautions to be observed. The
like radical measures. It is advisable to insist
smooth shaving of the entire scalp, and the child s
linen or silk skull cap, that may be burnt from
and replaced by a new one. If there is no dou
diagnosis the practitioner should insist on this to
the scalp must be washed most thoroughly wi
and hot water, well rubbed in, a soft nail brush
useful. These means remove all scurf and greas
the scalp has thus been rendered perfectly clean,
then is the time for the parasiticide preparation.
be taken in the cleansing of the scalp to clean the
separately and by itself. The disease with its spo
to the root follicles, and doubtless this is the reaso
cult cure. If the case be not severe and not
the ointment of salicylic acid ʒi. to ℥i. of geolin

This ointment must be rubbed in with a good
penetrate to the roots of the hairs and of the dis
be infricted with a piece of lint. Tincture o

iodine may be painted thoroughly into and on the diseased patch or patches. Chrysophanic ointment, gr. x. to ʒi., is good, but liable to be followed by a wide-spread dusky hyperæmia. If the practitioner use it he should give the parents warning of the possibility of such an occurrence, which is often very unsightly.

Though I have advised the whole scalp to be shaved, some parents object to this wholesale measure. If there be only one patch, and this recent, the parent may overrule the doctor's directions. But then the hair must be clipped perfectly close to the scalp, and for some distance around the patch. There is less risk in this partial treatment if the child be healthy. If he be much debilitated or scrofulous the chances that the parasite will spread are very great.

The necessity for careful hygiene of the patient's person and environment with a view to promoting his *general* health cannot be too strongly urged. Cod-liver oil and iron or other tonics are also advisable, as well as fresh air and good nourishing food.

An application of blistering fluid may cure a recent case. Or this followed by an ointment of perchloride of mercury, gr. x. to ʒi. of elderflower ointment (Ung. Sambuci). Or carbolic acid ʒi., glycerine ʒss.

In the chronic cases Tilbury and Colcott Fox recommend the whole head to be soaked in sulphurous acid lotion (saturated solution 1 part, water 3 parts), in order to get rid of the disease on the surface. Epilation should be practised with a pair of special forceps, wherever possible, but this is impossible if the hairs be much diseased. Coster's paste, consisting of ʒii. of iodine and ʒi. of the colourless oil of tar, may be painted on with a camel's-hair brush, cautiously, for seven or eight times at intervals of three days. The application will form a cake, and this may be soaked off with a poultice well larded on its under surface so as to soften the crusts. The cake should be entirely removed before the application is repeated.

In the removal of the cake a number of hairs are brought away also, and this may take the place of epilation. It is useless to apply Coster's paste to the surface whilst the incrustation is on the scalp. The applications should be continued till the hairs begin to sprout naturally, then some milder parasiticide may be used.

In severe cases epilation must be carried out repeatedly. The production of artificial kerion, by the use of strong irritants, is in these cases a valuable method of treatment. I have frequently used croton oil, painting a little on every day for two or three days until the diseased patch—only one should be done at the time—has become a veritable soft boggy "kerion." Then the part is dressed with simple water dressings or bread poultices. Care must be taken to prevent the croton oil from overflowing. It rarely happens that any marked alopecia follows this treatment, though some time may elapse before the hair commences to show.

In infants and young children these strong applications must not be used. Ringworm is usually easily cured in infants by the Ung. Salicyl. The most obstinate cases that I have seen have been in scrofulous boys and girls about seven years of age.

In many cases a change of parasiticides is an efficacious local method of treatment:—

White precipitate ointment diluted once with lard. Unguentum sulphuris. These may be rubbed in with lint. Or the glycerine of carbolic acid 2 parts, and glycerine 1 part, may be painted on with a hard camel's-hair brush. The oleate of mercury ointment, 5 per cent., may be rubbed in with a sponge. Great care should be taken to prevent the application from running down the face or neck, so that the mop must not be saturated, and every care must be exercised to see that during the night-time the preparations do not trickle down from the scalp on to the sensitive skin. The children

should wear a well-fitting skull-cap on all occasions, night and day. Should the scalp become sore and tender and inflamed, Alder Smith advises that all treatment should be suspended with the exception of anointing the surface with carbolic ointment, and applying over this bread and water poultices. A cure often follows this method of treatment.

Dr. Alexander, U.S.A., has treated an obstinate school epidemic—after epilation, corrosive sublimate, sulphur, isolation, and hygienic arrangements had failed—by the following method:—After shaving, washing, and epilation, the patches were painted with a solution of chrysarobin 10 per cent. in liquor gutta-percha. The principles of treatment were isolation of patches of skin, exclusion of oxygen from the fungus and the parasiticide effect of the chrysophan. Seven grains of chrysophanic acid dissolved in ʒi. of chloroform is the most efficient application that Alder Smith had used (Nov. 1, 1884).

Shaving the patches, washing the head with warm water, then rubbing in oil of turpentine till it "nips," next washing with ten per cent. carbolic soap, and finally painting with tincture of iodine, is the method of Dr. J. Foulis.

Dr. Payne has employed eucalyptol, ʒi., paraffin ʒii., vaseline ʒii. for early cases.

Dr. Harrison uses two solutions: (1) An ounce of liquor potassæ, containing three grains of iodide of potassium; (2) an ounce of nitrous spirits of ether, containing three grains of corrosive sublimate. The hair is cut short; No. 1 is applied for a few minutes to the affected parts, and then No. 2. Mr. Malcolm Morris has diluted the liquor potassæ, because it caused kerion. In uncomplicated ringworm he states that the ten-per-cent. alcoholic solution of salicylic acid is most valuable.

Tinea circinata occurs in circular red, scaly, itchy patches, on any part of the surface of the body. It spreads at the circumference and fades away at the centre. The parasite

should be searched for in the raised epidermis at the periphery of the circular patch. There is no difficulty about the treatment of the ringworm. It is scarcely necessary to clean the surface, though that makes assurance doubly sure. The ointment of salicylic acid may be applied, or better, the strong tincture of iodine. One application is usually sufficient. An ointment of five grains of white precipitate with ten grains of pure carbolic acid in an ounce of geoline or vaseline; or the red oxide with the ammoniated mercury, of each ten grains in an ounce of lard or vaseline. The disease is contagious, and may spread on the same individual or be taken by another person. A warm temperature promotes its growth, and some of the most luxuriant growths are found on the genital regions in warm climates.

Chloasma, or tinea, or pityriasis versicolor occurs as brownish or fawn-coloured circular areas on parts of the skin covered by flannel; the spots are raised, itchy and scurfy. The conidia under the microscope are seen to be larger than those of the trichophyton, and the wavy mycelial threads are more evident. The flannels should be discontinued unless they are needed to protect the chest. The longcloth mixture of silk and cotton makes a good underclothing. And the regular application for many days of a solution of corrosive sublimate and glycerine, or sulphurous acid lotion, or hyposulphite of soda lotion, will effect a cure.

℞ Sol. Hyd. Bichlor., ℥ss.
Glyc., ℥ss.
Aq., ℥iv.

℞ Sodæ Hyposulph., ℥ss.
Glyc., ℥ss.
Aq., ℥vi.

The grease should be first removed from the skin by soft soap and water, and turpentine if necessary, care being taken

not to set up too much irritation in the skin. The great point is to give the applications some chance of doing their work by removing all the matter that prevents them from coming into direct and thorough contact with the disease fungus.

Tinea favosa is a disease of rare occurrence south of the Tyne. It affects the hairy scalp, and is due to the growth of the achorion Schönleinii. Its characteristic manifestations consist of sulphur-yellow cup-shaped crusts, in which the hairs are imbedded.

The treatment consists in removing these crusts away by means of abundant soaking with lard or oil and linseed meal poultices. Epilation should also be practised with a pair of special forceps. The hair must be clipped away altogether if the scalp is much affected, as is usually the case. When the surface of the scalp is perfectly cleaned, and this may necessitate the use of antiseptic lotions of corrosive sublimate, or sulphurous acid, then is the time to make the special parasiticide applications. The carbolic acid and glycerine, or the salicylic acid preparations, as recommended under Tinea Tonsurans, may be employed, or the five per-cent. solution of the oleate of mercury, care being taken to prevent the irritant from coming in contact with the skin of the face. Many of the favus children are greatly debilitated as the result of want of fresh air, food and light, and cleanliness. The removal of the defects of hygiene and the administration of tonic remedies, of the iron, arsenic and cod-liver oil sort, will do much to remove the disease and prevent its recurrence.

MOLLUSCUM CONTAGIOSUM.

The sessile hemispherical umbilicated little tumours occur somewhat frequently on the face of children, and occasionally in other thin-skinned parts of the body. If their contents be squeezed out the first stuff that comes appears to be whitish sebum, and this is followed by a pale, translucent, slightly

pink, lobulated mass of granulations, which und
scope may be seen to consist of round cells
incipient fatty alteration. The tumours ge
rather freely when thus their contents are
pressure between the two thumb nails. This, t
a painful procedure, is the best treatment. Th
the tumour may be first snicked with the la
tumours be large, it is recommended to touch
after expression, with the solid point of nitrate
little children, to save the mother's feelings, ch
be used as an anæsthetic. Small tumours may s
being touched with a little of the acid nitrate
nitric acid. A piece of match-wood, brought t
be used. Successive crops of tumours often p
and unless systematically attacked may disfigu
weeks and even months together. They are c
sometimes occur in epidemics.

ECTHYMATA

Are more or less tender pustules with hard, i
They are very common in children, and occur
tules about the face and limbs. The crusts tha
are thick and dark.

The treatment of these pustules is very sim
place they only occur when the general health is
are very prone to occur when actual cachexia
may be also seen in children whose health
deranged.

Doubtless a local irritation, even a scratch
cause of them, but an irritation which in
would leave no mark behind it. Sometin
pediculi cause them; so the chief treatment c
tion to the air, food which should be good an
drink (a little beer or wine may be necessar

of the patients; cleanliness is a great matter. And if there be scabies or pediculi these must be treated first. The bowels must be regulated. Cod-liver oil should be given, and iron wine if there be anæmia. Some authors say that quinine is a specific for these pustules. The scabs should be removed by soaking with oil, and a poultice if necessary. They may then be picked off with a clean aseptic pair of dressing forceps; when the raw surface of the sore has been cleaned with carbolic oil 1 in 40, an ointment composed of carbonate of lead gr. iv., glycerine ʒi., and vaseline ʒi., may be applied, and kept so by being spread on a piece of lint; or the red oxide of mercury (gr. x. to ʒi. geoline) ointment may be used instead.

ERYTHEMATA.

Erythemata, for the most part non-contagious, own a thousand causes—cold, heat, friction, scratching, flannels, parasites; fevers, catarrhs, and sore-throats; digestive disturbances, dentition and rheumatism. The most important are those that indicate the presence of rheumatism. Their fugacious nature is very marked. Intertrigo is not considered here, but as an eczema. The removal of all local causes of irritation is the first essential in the **treatment** of erythemata. Then personal hygiene, as elsewhere defined, must be seen to. And specially should the bowels be kept free by simple means—castor oil or rhubarb and soda in a capsule. Frequently tonics (quinine, cod-liver oil, and iron) are needed, for though the irritant be the exciting cause, yet it might be insufficient to cause an erythema in a healthy child. But *idiosyncrasy* should be remembered. The *itching* may be relieved by such soothing agents as:—Zinc ointment; lead lotion, ʒi. to vaseline ʒi.; zinc oxide, ʒii., glycerine, ʒii., and lime water, ʒiii.; calamine powder and oxide of zinc, half an once of each with ʒss. of glycerine and eight ounces of rose water; nitrate of silver, gr. ii. to ʒi.;

alum, gr. x., glycerine, ʒi.; rose water, ʒii. The erythemata of rheumatism hardly need any local treatment, but the patient should be confined to bed as a prophylactic.

ERYTHEMA NODOSUM.

This is allied to rheumatism. It is very doubtful whether heart disease or true rheumatic arthritic swellings occur in immediate connection with it. (See a paper by S. Mackenzie in "Clinical Trans.," 1886.) The large bumps with bluish borders come out in successive crops on the front of the shins and thighs, and backs of the forearms and arms. Their eruption is often preceded by rather severe pains and lassitude; occasionally the knee joint swells. There is usually slight fever and indisposition. The bumps tend to recur in the same patient. Their situation, and size, and number, and their disappearance as of fading bruises, are sufficiently diagnostic. It is very rare under five years of age. We do not know how to avoid the relapses of this complaint. The stools may be infrequent or unhealthy. The bowels should be freely opened at the onset of an attack by saline purgatives. Eno's fruit salts ʒiii., or sulphate of soda ʒss. and magnesia ʒss., with infusion of senna ℥i., may be given hot before a meal to a child five years old. The bowels should be kept gently relaxed all through the two or three weeks' illness. It is advisable to keep the patient abed, or at least confined to a couch in one room, the ventilation of which should be as perfect as possible.

Local applications.—It is well to wrap the legs up in cotton wadding, and hot spongiopiline may be applied and repeated every hour if the pains are bad. Cold compresses are preferred by some. Lead water and laudanum may be used to wet the compresses. The *dietary* should be light but nourishing during the illness; not much meat or eggs, no potatoes or sweets. A little wine may be required for the debility or

feeble digestion. Quinine sulphate may be prescribed in grain doses three times a day; it may be swallowed in pillules or mixed with glycerine. Dr. Eustace Smith recommends dram doses of oil of turpentine for chronic cases. It can be but seldom required. Some authorities recommend calamine lotion or bicarbonate of soda ʒi., glycerine ʒii., rose water ℥iv., to be applied hot to the bumps if painful. A few minims of fluid extract of cinchona in syrup of orange may replace the quinine. Iron may be given for anæmia.

URTICARIA.

Factitious urticaria and spontaneous non-contagious urticaria are very common, especially in the neurotic, and have the usual number of causes. The little white bumps are very distressing to the patients. The wheals are not so distinct in children. The chronic form of urticaria, *lichen urticatus*, may persist for months, and in spite of much medicinal treatment. Urticaria is sometimes of rheumatic source. *Acute urticaria* occurs in the child as the result of indiscretions in diet similar to those in adults—shell fish, mushrooms, potted meats or sweetmeats; frequently the onset is pyrexial and attended with vomiting and prostration. Excessive clothing and great heat may cause it. Scabies and more superficial parasites may be causes of urticaria in the child, if the skin is well looked after and not very delicate. As a rule in the poor and neglected, these parasites cause a greater degree of inflammation.

The removal of all local sources of irritation, the abatement of *gastric* symptoms, the opening of the bowels by simple means, and keeping the child in bed on a milk diet for a few days, is the best mode of combating the acute form.

Emetics are useful if the spontaneous vomiting has not left the child free from discomforting nausea. A dram of mustard in five ounces of hot water, and tickling the fauces

if the child be old enough to take such medicat
Or in younger patients ipecacuanha wine ʒi.
ministered, repeated in a few minutes if nece
dose of sulphate of zinc, gr. x., with a hot
bowels may be kept regular by the rhubarb and s
or a few doses of infusion of senna; or if the
hepatic disorder, by a dose of mercury an
rhubarb. A hot alkaline *bath*, ℥iii. bicarbonate
gallons of water, is excellent to relieve the itchi
out the eruption; bran liquor may be added
The itching may be relieved by many applicatio
acid solution 1 in 100; Liq. Carbo. Deterg.
cyanide of potassium ʒi. to ʒxx. All these ar
warm in the acute eruption, and they should
stantly on the eruption, if the itching is bad,
clean aseptic rags. Occasional dabs with the
ticular parts may be alone necessary. Son
dusting powders. Exclusion of air is the appa
lichen urticatus the excretory organs, bowels,
sweat glands must be kept working, and the b
be surcharged by excess of food.

All *foods* should be given in strict moderatio
regulated, but there is no special food that need
altogether. Milk, meat, second-day's bread,
a little cauliflower, are suitable for a child two
drug that I use and recommend is *liq. arsen.*
♏i. doses t.d.s., after the bowels have been g
Mist. Rhei. c. Soda, or fluid magnesia, for a f
itching may usually be allayed by Lot. Carbo
ʒii., or more water, as may be required.

Dr. Eustace Smith strongly advocates *quini*
I have tried this in a few cases, and it cert
admirably, but not better than the arsenic tre
not in favour of large doses of quinine in c

disease. It may be erroneous, but I think I have seen chronic deafness result therefrom, and sometimes the nervous system has seemed to me to be much perturbed for months afterwards. Many of the cases of lichen urticatus, indeed, are cured straightway by regulating the food and drink and by the use of the Mist. Rhei. c. Soda, or other antacid and laxative.

Meigs and Pepper advocate nothing but mild laxatives, saline or mercurial, and antacids such as magnesia and lime-water, if the stomach be sour. I am sure that this treatment is very good, but it will not cure more than half the cases. Some good tonic will be necessary.

To relieve irritation.—Simple dusting with flour or toasted rye; salt and water when the skin is not excoriated. Sulphuret of potassium baths, ʒii. to 2 gallons, are recommended for chronic urticaria. Also calamine lotions. Carbonate of ammonia and acetate of lead, of each a dram, dissolved in ten ounces of rose water, may be used in acute urticaria. It is seldom necessary to resort to other soothing applications than the tarry one mentioned above. Storax ointment (storax ʒi., lard ʒii.) is lauded by some, sulphur by others. These are most serviceable when parasites have been at work. But I prefer balsam of Peru ʒii. to ʒi. of vaseline. Calomel ʒi., belladonna ext. ʒi., lard ℥iv., may be used to allay itching.

ROSEOLA INFANTILIS.

This sometimes occurs apart from rheumatism, small-pox, and vaccination, when it is usually set down to chill or slight gastric derangement. It may look like measles, but the rash is not so dark-coloured, and is not usually crescentic in arrangement. There are no catarrhal symptoms. It is usually patchy in distribution, but may be universal. It is prone to recur in the same child, and often in autumn or summer. The rash departs of its own accord. The malady may be treated with Mist. Rhei c. Soda ʒii. to a child three years

old, to which sulphate of magnesia gr. x. may be
addition a dose of seidlitz powder or Eno's fru
be needed. The itching may be relieved by co
vaseline. The diet should consist of broths a
water whilst the rash lasts. An antacid of fluid
soda and a purgative may be ordered to abate acid
gastric and enteric catarrh. The child, if young
be put to bed in a properly ventilated room till
intestinal catarrh have subsided. Outdoor
attention to the dietary may be ordered on gene
after the child has recovered, and the skin mu
clad as to be protected from chills due to sudd
in the weather.

CHILBLAINS.

Dr. Dawson Williams points out that the fir
matous stage is most amenable to treatment.
tants as a rule are useless, but iodine, acting as
may cause pressure on the deeper layers of th
lodion is valueless, for the skin cracks with
Cotton wool carefully packed is very useful. C
allays itching. Cold and wet should be avoid
is less harmful. Washing in very hot water is
Woollen stockings and armlets should be worn
are necessary. Tonics improve the general h
phate of iron is recommended, not cod-liver oil.
ing must be avoided.

ECZEMA.

Eczema simplex, eczema rubrum, and ec
ginodes occur in childhood with great frequency
also to speak of a local variety—eczema ca
more or less widespread eczema infantile.

Eczema simplex occurs in various parts of t
frequent behind the ears, on the cheeks, a

nostrils. Its first stage of a red background with a crowd of vesicles thereon is not often seen. What mostly greets the eye is a red moist surface more or less covered with crusts of yellow, brownish or blackish colour, according to the serous, seropurulent, or purulent character of the discharges.

Eczema rubrum is simply a greater degree of catarrhal inflammation of the skin, with corresponding increase in the local appearances, and is attended with constitutional disturbance, which is partly due to the inflammation itself; and partly the inflammation is dependent on the constitutional state. Its chief seats are the thin-skinned parts about the elbow, knees, axillæ, but it occurs also about the head and small of the back. The term *eczema pustulosum* is applied when there is a purulent discharge. Scrofula which makes chronic lesions also tends to make them suppurative. The *diagnosis* of the bulk of eczematous cases is not difficult. *Intertrigo* is known by its seat, and when the secretion is removed the papillary layer of the skin is seen not to be hypertrophied. Its discharge does not thicken linen. *Scabies* may cause an eczema. *Erysipelas* with scabs is known by the acute constitutional disturbance, the brawny infiltration and sharply outlined advancing margin. The first day of an eczema about the face may be mistaken for measles, but the absence of high fever and coryza is a sufficient distinction if the practitioner does not care to wait a day or two before expressing an opinion. Although eczema usually attacks the thin flexor surfaces, it may also occur where the skin is thick; and then its vesicular character is often masked, a mere papular slightly scaly eruption appearing. Eczema passes through the stages of hyperæmia, papulation, and vesiculation, and sometimes pustulation. It is valuable to remember these transitions. *Psoriasis* is a slower eruption, with more desquamation and less effusion;

its chief seats are the backs of the limbs, where t
tougher.

The **treatment of eczema** consists in the comp
perfect removal of every conceivable kind of irritat
in treating the constitutional condition. The hand
muffled, if necessary, to prevent scratching, which
acts as a direct irritant, but frequently introduces
further irritant of dirt. Soaps should not be us
sore places. And I always interdict the use
believing that sweet oil is a far better agent for
the sore; it may be employed with a piece of antisep
wool. The rubbing of clothes against the sore pla
be prevented, and anything that causes pressure
removed. The grand principle of local treatm
removal of every possible source of irritation. N
of towns and cities, and most places at the level
swarms with mechanical, chemical, and vital
impurities. Therefore the atmosphere must be
cluded, unless the patient be in a perfectly pure a
such as usually obtains at mountain stations. Th
will not do for eczema; the air is too salty and
Disorders of the blood-vessels, nerves, and lymp
are distributed to eczematous surfaces may prove
local irritation. These will be reconsidered further
the tissues of the skin itself may have had a conside
in the causation, and this defective health of cutan
plasm is the least remediable. But it should not b
that a period did exist in the child's career in whic
no eruption; and this should prove an encourage
practitioner in some of those obstinate cases
eczema that continue throughout the whole peric
hood.

Before *topical applications* are made the crus
must be removed. The ointments or lotions a

when applied over the crusts. If the encrustations be thin, and not abundant, they may be best removed by soaking with sweet oil or lard, and after this has had time to soften the crusts, they should be cleaned away with oiled antiseptic wool or lint. If the crusts be thicker, and lie over a thin bed of purulent secretion, sweet oil or lard may be allowed to soak into them, and a good linseed meal poultice, well oiled or larded, and covered with impervious oil silk and cotton wool, should be applied for a night or four hours. The next morning there will be no difficulty in clearing away the encrustations. Repeated poultices may be required. The removal is best effected by means of a clean pair of dressing forceps; then, before the applications are made, a clean, raw surface should be exposed to view.

For most weeping raw surfaces of this kind I use the following soothing astringent ointment :—

℞ Litharge, 3 parts.
Olive Oil, 4 parts.
Lard, 2 parts.
Yellow Wax, 1 part.
Eucalyptol, 1 part.

For those parts of the skin that are not moist, but dry, and red, and itchy, my favourite prescription is —

℞ Lotio. Carbon. Deterg., ʒi.
Aq., ʒii.

The ointment should be kept constantly applied by being spread on lint. If the face is affected in some degree, a mask of lint, on which the ointment is spread, may be used, apertures being cut for the eyes, nose and mouth. Crusts and scabs must be removed as soon as formed. The lotion should be applied by means of clean aseptic rags, and these are to be kept constantly wet with it; or if they are ill-borne, sponging or washing with the lotion for a quarter of an hour at a time may be practised. Another good soothing lotion for

moist eczema is composed of a dram of oxide of
dram of liquor plumbi subacetatis rubbed up in a
neutral geoline or vaseline.

Local applications are important, but *constituti*
peutics are of greater importance. Sometimes car
tion and inquiry reveals no constitutional taint wh
gouty history may be overlooked.

Elimination of internal irritation.—A gouty d
an important cause of some cases of infantile e
the child be healthy, whether there be a gouty c
family history or not, I usually prescribe the mixt
barb and soda three times a day (3i. for a child
old), or some such mild laxative as castor oil or flui
This keeps the bowels regular, and perhaps acts
liver, increasing its excretory functions. By suc
may believe that the blood is kept in a purer stat
fore less liable to irritate the eczema.

Restoration of health of skin by alteratives.—
the kind under consideration, after the disease
chronic, I also use liq. potassæ arsenitis in tw
four times a day, immediately after the meals. It
bined with iron wine or ferri tartarati gr. ii., Syr.
and Aq. Carui 3ii. It rarely causes any irrit
stomach; should it do so, smaller doses may be giv
be suspended, and the treatment for gastric ca
tuted. Generally it seems to improve the condi
eczema sensibly abates. It may be continued
months. Debility and pallor may need cod-liver
wine may be ordered with advantage, instead of o
(see Scrofula).

Syrup of iodide of iron may be prescribed, sh
scrofulous signs, instead of the oil; but I pre
The iodide may be given in three to five-drop
or syrup or decoc. sarsa

Mercury as a rule, should not be used, but small doses of Hyd. c Cret. or calomel may be given when the stools are pale or clay-coloured.

But it will be highly necessary to attend to the state of the *digestion and bowels*. In all cases the dietary should be specified. The first principles are to see that the albumins, fats and starches are digested by inspecting the stools and watching the increase in weight of the child. In the *early stages* of eczema the dietary should not contain sweets, fruits, fat, or much meat, or much starchy foods. The diet must be unstimulating; should the complaint occur in children above the age of 18 months, meat and potatoes should be left off for a few days. The food should consist chiefly of fluids.

Any sourness of breath or acidity should be treated by antacids—magnesia or soda. When the disease is chronic all kinds of foods may be allowed in moderation. I am sure, from personal observation, that a moderate allowance of fat does not increase the eczema nor render it more chronic. Sweet stuff from the shops is not good for any children, and I always interdict its use in eczema or any other disease; but the case is not the same with fruit compôt or home-made jam; though the amount of sugar the latter contains should make us cautious of allowing the jam in too large quantities. Fresh stewed fruit indeed has at times seemed to effect an improvement in the eczema, and there can be little question that the bowels act better when it is taken regularly. Sudden changes in the diet are frequently attended by alterations in the eczema, sometimes for the worse, and conversely. Tea and coffee frequently make eczema worse. I do not allow them to any children. The children may be made to believe they are taking tea or coffee by a little device of the nursery.

When the eczema is acute the distress may be considerable, greatly interfering with the child's sleep and making him

peevish and restless during the day. Under th
stances the bowels should be unloaded by a la
and soda powder gr. v. for a child six months c
castor oil. The red and hot areas of skin may b
simple water dressings or emollients, as cold bar
or cold bran-water; the barley-water made a
described, and the bran-water by pouring boili
bran placed in a sieve, and then waiting till the f
has cooled. The bowels should be kept gently
fusion of senna and sulphate of magnesia or flu

The hygiene of the environment and personal
fully as necessary for eczema as for other diseas
yond what I have indicated there is nothing spe

Diarrhœa is treated as recommended on p. 5

Other Local applications.—Mild stationary
been treated by dilute nitrate of mercury ointm
ointment, or zinc ointment made with benzoated
are very suitable, though I prefer those mention

In the acute forms cold-water dressings, or c
lotions of barley water, marsh mallow, linseed
water poultices, have been and are used. Wh
must be kept constantly applied day and night,
surface must be protected by aseptic lint.

Lassar recommends this paste in chroni
children :—

℞ Salicyl. Acid, gr. xv.
Zinc Oxide } aa., ʒvi.
Starch, }
Vaseline, ℥iss.

It does not dry, and sticks well to the sore part

Oleate of zinc is recommended in acute ecz
maker. An ointment may be made of ʒi. to
œoline. The powdered olea n inte

Limited chronic patches afte

scabs off, by tar ointment or some strong lotion, as nitrate of silver two or more grains to the ounce. Various ointments and lotions of mercury are also used. They are all antiseptic, and stimulant or irritant. Care should be taken before making a second application to see that these stronger applications do not excite the eczema too much. I prefer the tarry applications.

Xanthelasma (Xanthelasmoidea, Xanthoma multiplex) occurs rarely in childhood, and may be congenital. The lemon or chamois-leather-coloured patches occur scattered about the skin of the arms, legs, and trunk, but the eyelids mostly, not always, escape. Dr. T. Barlow has recorded ("Path. Trans." xxxv.), one case in which the eyelids were typically affected. It may be hereditary, and more than one member of a family may be affected. The general health is certainly not always good, and though jaundice has not been recorded in connection with the disease, yet urticaria, indigestion, lithuria, and hæmaturia were observed in Dr. Barlow's case of congenital xanthelasma palpebrarum. The treatment should be hygienic and dietetic. Warm woollen clothing and out-of-door exercise to keep up the action of the skin and bowels, are very important. The amount of nitrogenous food should be reduced if there be any sign of lithiasis, and the treatment may be carried out as directed for that derangement of health.

Xeroderma and Ichthyosis are generally of congenital date. Warm and emollient baths of barley water or oatmeal water, or alkalies, with the infriction of vaseline, olive oil, oil of sweet almonds, is the only local treatment. But it is important to remove the scales and patches as much as possible, and to keep the skin perfectly clean. Great is the necessity for attending to the state of the bowels and urine. And the diet should be regulated in accordance with the general principles formulated at the beginning of this book.

For the description of a case of "Harlequin fœt
paper in the Royal Medical and Chirurgical Transa
Mr. Bland Sutton.

Prurigo is an eruption of isolated papules of the
the skin. The papules occur chiefly on the extens
The itching may be very severe. The treatment
the avoidance of unfavourable hygienic conditions,
ill-ventilated dwellings, improper food (salty and
especially), and of uncleanliness of the body and its
Warm baths, or better, mucilaginous baths of lins
and barley water are valuable for cleansing the
relieving irritation. Alkaline baths—one ounce of
of potash to each gallon of water—are also use
irritation. The inunction of soothing ointments
sweet almonds may be tried, or a weak lotion
carbonis detergens. Sulphurous acid baths, one o
gallon, has relieved obstinate cases.

CHAPTER XI.

THE DISEASES OF THE MOUTH AND THROAT.

SIMPLE STOMATITIS.

A form of simple inflammation is met with in infants, especially during the period of the first dentition. The gums and lips become swollen, and the colour of the mucous membrane of the mouth becomes dark red, livid, or more scarlet. The infant cries whenever the inflamed parts come in contact with resistance of any kind; hence the child cries when put to the breast or given the bottle. There constantly flows from the mouth a slimy, watery saliva, and, the epithelium of the gums and lips is prone to become macerated and removed, giving rise to little patches on which thrush may grow, as on any abnormal surface. The submaxillary region and its glands may participate in the inflammation, and become swollen and tender. The lips and gums feel preternaturally hot, and the temperature of the body is raised, as a rule, not above 100·5, but I have taken a temperature of 104 in the rectum in one case, when there appeared to be no further explanation than the simple stomatitis to account for the fever. But in addition to its complicating the process of teething, we should not forget that the development of measles and scarlet fever, and other acute specific fevers, may be attended with the appearance of the same form of simple stomatitis, and that it is possible that the stomatitis may be the leading feature of the acute fever, and thus explain some cases of stomatitis with high temperature. At the same time it cannot be overlooked that the heat-governing apparatus of infants and the highly neurotic

is easily thrown out of gear, at least for a ti
of the sleeplessness and irritability of infants duri
should be explained by the simple inflamm
under consideration. As to the pathology there
be a doubt that the active physiological process
of the teeth must be a potent factor in the caus
inflammation, in harmony with the well-establish
of pathology which demonstrates the frequency
the sites of rapid growth are the seats of morb
generally. Sometimes the inflammation goes
usual limits, or assumes another character as th
new cause (? microbe). Then we see an exudatic
of false membrane as happens in the stomatit
fever. The treatment of this simple form of
very easy (a small dose of castor oil); nothing
be done, for the inflammation usually subside
accord in the course of four or five days. Ind
hinted, it is not improbable that a still more tra
of the inflammation may occur, and be overl
mother, who does not consult the doctor u
signs have disappeared.

The **most local treatment** that can be requi
of a lotion of boracic acid, and chlorate of pot
over the inflamed parts, the infant's head be
forward to prevent the passage of the lotion do
A dram of each salt in a pint of water ma
lotion, and a little glycerine may be added.

APHTHÆ.

It is a disputed point whether the so-ca
stomatitis is of a vesicular nature, or wheth
spots are not due to an exudation of a
It is true that anything that could be call
in my experience seldom seen; but the muc

of the tongue is constantly being soaked by the oral secretions, so that a macerated look due to soakage of raised epithelium readily occurs, and thus masks the vesicular appearance as we know it in the skin. I have seen herpes facialis associated with aphthous looking ulcers in the mouth; and though this is no proof that aphthæ are of a vesicular nature, it does lend some countenance to the view. It has been held that all forms of stomatitis are but different degrees of one kind of inflammation. No doubt there is a gradation in severity between simple stomatitis, aphthous conditions, ulcerative stomatitis, and gangrene; but the mere gradation is insufficient to warrant all the degrees being described together, more especially as the clinical characters differ very considerably. The clinical differences may doubtless be attributed to a greater severity of the inflammation.

Aphthæ are very commonly seen in infants during the period of dentition. Though teething may predispose to the occurrence of such aphthæ, it can hardly be regarded as the sole cause, any more than the bronchitis or diarrhœa that are frequently accompaniments of teething can be solely ascribed to the same physiological process. Besides, aphthæ certainly occur in the mouths of infants before the first tooth is cut, and also after the last of the milk teeth has appeared. I cannot help thinking that the disease may be caused by the introduction of some irritant into the mouth; a child puts everything it holds in its hands to the test of the sense of taste.

The tongue is covered with small rounded spots of whitish, greyish, or yellowish appearance, each of which is bounded by a ring of bright redness. These spots may be isolated or confluent, thus giving rise to various shapes. The aphthæ occur on the inside of the cheeks and lips also, though they are less numerous in these situations; a few may also be

seen on the soft palate and other parts of the
throat. Constant running from the mouth, wi
smell of the breath and secretions, are symptom
as they are symptoms of all diseases of the mouth
any consequence. A certain degree of fever
the disease, and the infant is usually restless an
the act of sucking, or attempts at chewing,
swallowing, are attended with discomfort and cr

The **treatment** of aphthæ consists in attentio
and to the *gastro-enteric canal*. The *food* should
on the principles laid down in Chapter II. It
found that tea, cheese, pastry, sweets, cakes, bee
of everything have been freely partaken. Ther
vomiting or diarrhœa, a small dose of castor o
by the castor oil mixture, or the bismuth one (
90) will suffice.

Locally the mouth should be thoroughly a
cleansed by syringing with simple water, c
Condy's fluid, and after each cleansing a lit
honey, or glycerine and borax (one dram to
should be applied to the sore parts by means
hair brush or the finger.

Attention should also be given to every hyg
stance.

Chlorate of potash lotion gr. x. to ʒi. is a
application. *Bismuth trisnitrate* has been
Borax and chlorate of potash may be combi
solution of sulphate of copper may be pain
camel's-hair brush. Glycerine alone is an anti
solutions of acids also. Iodide of potassium g
be used as a paint. Also sulphurous acid
Salicylic acid one per cent. alcoholic solution
application. Quinine internally in grain do
hours has been prescribed when diarrhœa is p

barb mixture and Hyd. c. Cret. may be used to correct indigestion and irregular action of bowels.

THRUSH.

Thrush is an epiphenomenon. It is due to the growth and development of a yeast-like fungus—the oïdium albicans—on deranged or altered mucous membranes. Some say it is the common mould that forms on wine. It may occur in any part of the mucous membrane of the alimentary canal. The fungus is believed to be identical with that of the lactic acid fermentation of milk. Of course the mouth is the chief seat of the thrush, but it may be found in the gullet, in the stomach (posterior surface, near lesser curvature, and near pylorus, rather than elsewhere—this is the lieu d'élection of all gastric alterations), and in the intestines, chiefly cæcum, which is again a favourite seat of disease. The mucous membrane must be disordered in order that thrush may thrive on its surface. Its reaction, like that of all healthy tissues (except the surface of the stomach), should be alkaline, but acidity is a favouring element in the growth of thrush. A piece of blue litmus paper generally turns red when applied to a patch of thrush.

It will be gathered that infants with thrush are always out of health, and may be seriously so. The symptoms of heat of mouth, thirst, vomiting, and diarrhœa, with fever, which may be high, are to be set down not so much to the thrush as to the derangement of the mucous membrane. When thrush occurs as the epiphenomenon of a simple temporary catarrh of the mucous membranes it is not a dangerous sign. It has an ill omen when associated with food atrophy or marasmus from any cause.

Thrush may be mistaken for particles of *curd* arrested on fauces, or hanging about the cheeks and tongue. The latter may be easily removed by wiping, and the surface beneath

them will be seen to be healthy. When the thru removed a hyperæmic or excoriated or ulcerated brought to view. Diphtheria seldom has any rese thrush.

The **treatment of thrush** is almost entirely h preventive. The first and most important part of treatment is the regulation of the food, and the i an inquiry into the state of the *food utensils*. As oft food will be found to have been given in unsuitab and at irregular times and of improper kind (see C The infant may have had too much boiled bread the form of so many of the unmalted and malted foods. These, beyond a certain amount being undergo fermentation with the development of aci too, the bottle, or teat, or cup, or spoon, will be fo clean and aseptic as they really ought to be. W and food vessels have been attended to, the s methods should be directed to the air that the chi This, as usual, must be free from stench or off stuffiness, from humidity and coldness. It must warm. So it should not be passed first throug closet and then into the nursery, and equally be fouled by the presence of soiled napkins, soil foods, dirty toys and other articles. It must n by being used by too many people; hence, the have sufficient cubic space, and be properly ven water used for food purposes should be boiled both, and not be left uncovered in the room, gases and dust with bacteria and epithelia fall i

Diarrhœa and vomiting must be treated as under simple and inflammatory diarrhœa and at chief indications in the thrush that attends sir porary derangement in an otherwise healthy abate acidity by the use of alkaline carbonates

intestines of all irritative matter, and to take good care that no unsuitable matter is again introduced. Hence five-grain doses of bicarbonate of soda with a grain or two of rhubarb (to bring a little more bile into the intestines), and a dram of compound infusion of gentian (as a bitter and preventive of fermentation), to be taken thrice a day, is a good prescription for a baby 12 months old, provided the bowels have been opened previously by a dram of castor oil or six grains of rhubarb and soda.

There is no need to keep the infant indoors if the weather be fine in the day-time, as it is likely to be, for thrush is rifest in July, August, and September.

Last, but not least, local hygiene and asepsis. The mouth should be syringed out with weak Condy's fluid or simple water; it may be swabbed out with a piece of wet, soft, clean rag, which should be burnt after being once used; or a piece of sponge in a sponge-holder; or a full camel's-hair brush soaked in the weak Condy's fluid. When the surface has been thoroughly cleaned in this fashion, then comes the alkaline lotion, in the form of borax gr. x., glycerine ℥xx., and water ℥i.; this should be freely used, and repeated four or five times a day—the oftener the better. Alkalinity is unfavourable to the growth of the oidium. For cases of thrush complicating athrepsia, the same treatment must be appended to the treatment of the marasmus.

More or less stomatitis with ulceration may complicate.

Here chlorate of potash is used both externally and internally (see Stomatitis). Carbonate of ammonia has been prized, and may be given in grain doses in milk, four times a day, for a child one year old.

Prophylaxis.—It is a good thing to clean the mouth with warm water after each meal; this may be done with a piece of lint or wool, which should be burnt after use. Camel's-hair brushes or sponges would come expensive. If used they

must be kept in aseptic solutions, such as ʒi. t
salicylate of sodium.

ULCERATIVE STOMATITIS.

By some this and aphthæ are believed to corresp
foot and mouth disease of cattle, and consequer
communicated by cow's milk to children. Ger
ulcerative disease occurs in childhood, as opposed t
i.e., after the second year. Ulcerative stomatiti
acterised by sponginess, swelling and redness of
that bleed easily; on the surface a greyish white o
exudation appears. The fœtor of the breath an
vation and difficulty of mastication and deglutitio
to all diseases of the mouth are well marked h
morbid process varies in extent and severity;
palate and cheeks are frequently involved; it
spread by mere contact. The ulceration may lea
teeth, to necrosis, and to much bleeding. There
nausea, and the tongue is generally thickly loa
dirty fur; usually the bowels are constipated
temperature raised to 102° there or thereabouts.
and attention the disease may be cut short an
may disappear in a week. But it sometimes lasts lor
in a straggling fashion, the ulceration hardly
When this is the case touching the ulcer with
hair brush loaded with nitrate of silver (gr. xx
tilled water) will generally heal the sore.

For the **local treatment** of the ordinary cases
passes the chlorate of soda or potash. The mou
thoroughly and as frequently as possible syringe
out with this lotion (gr. x. to ʒi). Internall
remedy undoubtedly does good, but I have
cases by the local application alone, and I a
whether the prolonged administration of the ch

not induce debility and anæmia. True they are not required for long in this disease. The usual dose is three grains of chlorate of soda, with twenty drops of glycerine in two drams of water for a child two years old. Hydrochloric acid dilute ♏iii. may be added, or half-a-grain of quinine. The mouth must be frequently cleansed with the lotion, and the child, if old enough, should be kept gargling for the best part of its time during the day. The lotion may be mopped on with a plug of absorbent wool. All the *food* had better be in a liquid form, and cold. After the completion of each meal the child's mouth should be washed out with the chlorate of potash lotion.

Cases of this kind often come from mews and from other quarters of the poor which are liable to have the atmosphere contaminated by effluvia of various kinds. The necessity for *fresh air* is as great in the treatment of these cases as is the necessity for *proper feeding*. Tea, cheese, pastry, sweets, cakes, and excesses of sugar and starch (potatoes, sago, tapioca, &c.), must be avoided. (See chapters on Hygiene and Feeding.) The food should also contain enough of the antiscorbutic element, for there is reason to believe that scurvy may manifest itself chiefly as ulcerative stomatitis. A little port wine or brandy is most valuable in the debilitated and cachectic. Very loose teeth may be extracted. But if only slightly loose they may become fixed again. Sometimes a tooth keeps up the ulceration. Often necessary are *tonics* to raise the standard of health; mineral acids and cinchona are best. Iron in any form may be given if there be anæmia. Tonics are valueless unless the primiæ viæ are acting regularly. Some combine the tonic with the chlorate. The following prescriptions are suitable for a child two years old.

℞ Dilute Nitro-Hydroch. Acid, ♏iii.
Spt. Chlorof., ♏iii.
Tinct. Aurantii, ♏v.
Water to ℥ii. t.d.s.

℞ Dilute Hydrochl. Acid, ♏iii.
Syrup of Orange, ♏x.
Inf. Cinch., to ʒii. t.d.s.

℞ Compound Tincture of Cinchona, ♏xx
Syrup of Mulberries or Glycerine, ♏xx
Water to ʒii. t.d.s.

℞ Mist. Ferri Laxans.
Sulphate of Magnesia, gr. v.
Dilute Sulph. Acid, ♏ii.
Sulphate of Iron, gr. ½.
Syrup of Ginger or Tolu, ♏x.
Peppermint Water to ʒii. t.d.s.

℞ Tinct. Ferri Perchl., ♏v.
Glyc. or Syrup, ♏xx.
Potass. or Sodæ Chlor., gr. iii.
Water to ʒii. t.d.s.

Anæsthetic.—In any ulceration of the mouth proper alimentation, painting a solution of hydr cocaine on the ulcerated parts may be used with few minutes before the ingestion of food. I am t that some children object to the taste and effect even more than to the pain attending unassisted This effect of cocaine is not remedied by flavourin lemon or rose. Further, a restricted regimen is almo indicated in ulcerative stomatitis at the outset. beef tea can usually be swallowed without su indeed the cold gives great relief to the morbid the mouth.

Should *necrosis* occur, hot poultices frequer may be applied outside the tender part. The st abated by frequent local cleansings: and the su be called in. (See Cancrum Oris.)

SIMPLE SORE THROAT.

Simple sore throat complicates catarrh (see p. 145). The great practical point is to diagnose it from scarlet fever and measles. This is not always easy when the case is first seen. The doctor is generally sent for in a case of *markedly febrile* catarrh. A very bright red throat—punctiform and uniform like the skin rash—is suggestive of scarlet fever. If there be a very rapid pulse, and the illness began with vomiting, but little doubt should remain. Explosive sneezing and injected eyes, with fever lasting 48 hours, indicates measles. The local symptoms of sore throat are like those of any disease about the throat—thirst, difficult and painful deglutition, uncomfortable sensations and more severe pain shooting earwards, worse when swallowing; cough, attempts at hawking, and possibly deafness with altered often nasal-toned voice. Nasal voice implies imperfect shutting off of nose from throat as the result of imperfect action of the soft palate. Children and infants ought to be protected from taking cold and getting sore throats by the adoption of those measures recommended for catarrh (see p. 145). These measures are most necessary in debilitated, in rheumatic, and in tubercular subjects. On being called to a case of the kind the first point should be to entertain the possibility of acute specific fevers. The bowels are usually confined, and the practitioner should order a mercurial purge—a few grains of Hyd. c. Cret., or one or two of calomel with compound scammony or jalap powder. I prefer the former for infants under two years, the latter for children above that age. The child should be kept in bed if there be much fever—102°—or if less fever be confined to one room. If old enough he may gargle the throat with chlorate of potash gr. x. to ℥i., with an equal part of warm water and ʒss. of a glycerine. Cold wet compresses, well wrung out and frequently changed, may be applied externally; they should

be covered with oil silk and fastened with a band
fomentations may be used instead, or a layer of c
simply to keep the surface constantly and unifor
If there be much redness with a glazed surface a
drop doses of tincture of aconite may be given
hour to a child three years old, until four or six
been given. The doses may then be given at
tervals, say till twelve hours have gone by. Th
reduces the inflammation, moistens the surface
morbid sensations and lowers the pulse and temper
gargling may be continued. Ice or iced water is
comforting, and besides does good to the throat.
dose of Dover's powder may be given to a chil
old at night time. This relieves the throat sympton
the skin and quiets the restless nervous system
When the local inflammation has almost subside
gargles may be used—alum gr. x. to ʒi. It ma
with a Seigle's apparatus. When convalescence i
the child, if old enough, may suck a lozenge
of potash, or a compressed tablet of the same,
lozenge.

The *food* should be of the fluid kind—barley v
broth, milk—during the febrile stage; later, goo
diet in the form of meat, eggs, custard and j
given. If the child be feeble or strumous, a litt
port wine, or high-class claret, may be given a
fever has subsided. Great care will be required
child to health, if he were healthy before; tc
glands from becoming enlarged, and to alter as f
his diathetic condition (see. p. 149). In *rheun*
the sore throat may be the first term in a series
phenomena, which may be more or less comp
attack of rheumatism, or may occur rather ir
fashion. *Stiff neck* is common with the rh

throat, more common than with ordinary catarrhal pharyngitis. In some children, not necessarily rheumatic, there is a great tendency to recurrence of sore throats from the slightest exciting cause, exposure or what not. In these it is recommended to attend specially to outdoor *exercise, gymnastics,* and *massage,* with a daily *cold bath.* (See p. 149.)

QUINSY.

Repeated attacks of quinsy are very common in some children during the second seven years of life. Each attack seems to be followed by an increase in volume of the organ after the acuteness of the inflammation has subsided.

These manifestations are probably not indicative of strumous origin, though Heberden long ago showed that struma could cause hypertrophied tonsils. In these cases the growth occurs slowly. *Acute tonsillitis* may be also a *rheumatic* phenomenon. (See Rheumatism.)

It is difficult to believe that a chill is always the cause of the quinsy; perhaps the tonsillar irritation proceeds from within, and is the result of faulty digestion or metabolism, the blood being charged with a greater quantity of "fatigue products." This would ally some cases of quinsy to gout and rheumatism. Undoubtedly a vitiated atmosphere, as in hospital wards with many suppurating wounds, or an atmosphere charged with moisture and emanations from the drains and sewers, are causes.

Sudden onset with fever (103°), often vomiting, lassitude, aching pain in throat and radiating up to ear, dysphagia, rapid pulse, and sense of chilliness are the customary chief symptoms. The tongue is coated with a creamy fur, the skin is moist and clammy, the tonsil or tonsils looked dry, glazed, deep red, and swollen; hawking, deglutition, coughing, mastication, speaking, opening of mouth are all avoided on account of the pain. The voice is nasal and liquids may

regurgitate through the nose; the misery and de
most intense. There is great tenderness, and
swelling behind the angles of the jaw. In a c
severity the fever keeps up, and the misery contin
or six days have elapsed, and the tonsil having
bursts spontaneously, or is laid open. Sometin
week of misery follows owing to suppuration sup
the other tonsil. All cases do not end in absces
not if treated early. The sudden onset of tonsil
unlike the ordinary run of diphtherias, and th
cheesy stuff of tonsillitis is not like the ordinary g
of real membrane. Moreover, actual glandular
is not usual in quinsy. With scarlet fever the di
be difficult, but the punctiform uniform bright red
and more considerable œdema of the palate
suffice for the diagnosis even before the skin rash

The **prophylactic treatment** of quinsy sh
doctor's chief consideration: *Exercise, gymnast*
cold bathing, and *systematic daily gargling, prot*
neck and chest, as well as of the whole surface fr
damp by uniform woollen clothing.

Not unfrequently the attacks are clearly trac
sanitary defects in the house and drains. Remov
part is followed by restoration to health and fi
further attacks. For the actual attack the w
purge, compresses, gargles or *sprays, aconite*
quinine, liquid diet, ice to suck, and *wine.*

The mercurial purge comes first and foremost.
of calomel and ten of compound jalap powder for
years old. This reduces fever, unloads the bowels, t
the tongue, reduces the inflammation and makes
and his throat more comfortable. Plenty of ice
frozen or cold mutton broth, or beef tea, or mil
required. In cases resulting from sewer ema

may be need for stimulants; the fever is usually less, and there is more depression of vitality as seen in the pulse and delirium. These cases, if suspected, should be treated by instant conveyance to a healthier region. The journey, properly managed, does no harm. *Aconite*, to be of any good, must be given early in drop doses every half-hour, the intervals being gradually increased. Twenty drops is sufficient altogether. If it is doing any good the skin will become moister, the pulse less bounding, and the tonsil less dry and glazed. It follows that the cases in which it will do most good are those with excited circulation, tense tonsil, and high fever.

It should not be continued after twenty-four hours. Then order :—

℞ Tinct. Ferri Perchl., ♏v.
Quinæ Sulph., gr. ii.
Magn. Sulph., gr. xv.
Glycerine, ʒss.
Aq., ℥ss.

for a child seven years old four times a day.

If the tonsil have not been reduced by the foregoing treatment, another purge as before and the thrust of a sharp bistoury into the tonsil with sequent bleeding is, I am sure, good treatment. The bistoury should be guarded by wrapping it up in a strip of strapping, or a Paget's knife will do quite well in children who are frequently manageable enough. The complaint is far more common in those who are some years old.

Frequent *gargling* with chlorate of potash gr. x. to ℥i., and as much warm water with a dram of glycerine, or inhalations of steam medicated with carbolic acid ʒi. to Oi., or Tr. Benz. Co. ʒi. to Oi. should be assiduously performed. These gargles give comfort and lessen the offensive odour of the breath.

Cold wet *compresses* changed every hour should be applied, and covered with a layer of oil silk and cotton wadding.

Poultices of bread and water or linseed meal, hot fomentations, or hot spongiopiline may be used instead.

The employment of *leeches* behind the angle of the jaw has been used in children in the early stages of inflammation.

If suppuration occur, as may be felt by the forefinger applied to the tonsil, a puncture should be made, and will give immense relief.

When all acute symptoms have subsided the iron and quinine should be continued without the sulphate of magnesia. *The food* must be *nourishing*—meat, eggs, milk, and a little rice or custard pudding, with fresh vegetables and a little wine—half-a-glass of port or a glass of claret to dinner. *Astringent gargles* of alum, tannin, or nitrate of silver may be used to help the gland in returning at least to its usual size. For the treatment of large tonsils see p. 306.

℞ Alum, gr. x.
Liquefied Honey, ʒi.
Aq., ℥i.

℞ Glyc. of Tannic Acid, ♏xxx.
Aq., ℥i.

℞ Nitrate of Silver, gr. x.
Glyc., ʒi.
Aq., ℥ii.

Chronic Sore Throat.—Sometimes the chronic sore throat is simply a relaxed congested freely secreting throat, but generally there are adenoid overgrowths beneath the mucous membrane also—granular pharynx. The children are often debilitated, if not strumous, and are troubled with cough and tickling sensations in the pharynx that induce hawking. More or less deafness is frequent, owing to obstructions, either by the growths or by mucus, of the openings of the Eustachian tubes. The cough may be obstinate and distressing. Some authors believe that chronic laryngitis is associated sometimes with chronic pharyngitis. The cough

is worse on going to bed and in the early hours of the morning—at the time when the vitality of the body is at its lowest ebb. The period of life at which these cases are seen is after the commencement of the second dentition.

Apart from the feeble vitality of these children's protoplasm, I feel convinced that humidity of climate is a great cause of the adenoid growths, and of the hypertrophied tonsils which often accompany them. It is most necessary to see that the dwelling-house is dry and situate on a dry soil. The seaside at a high elevation with perfect sanitation is the best climate for these children, though a dry inland air is good. Follicular matter of opaque, often cheesy material may be seen on the tonsils and on the adenoid follicles. They may be associated with mucous polypi about the nose, and without this complication they may, if severe, cause obstruction at the posterior nares, with consequent shelving and flattening of the nasal bridge. The same sort of thing happens to the membrana tympani from obstruction of the Eustachian tubes. There is overcupping of the membrane, and often some thickening of it. Besides the *climatic treatment* every care must be given to the *dietary* and *digestion*, as in struma (q.v.).

Cod-liver oil (℥i.) and iron wine (℥i.) should always be prescribed (see p. 65), and are, as a rule, taken without trouble. Syrup of the hypophosphites (℥i.) or phosphates (℥i.) of iron may be given instead. Quinine (gr. i.) in any form, or better, the Liq. Ext. of cinchona (♏iii.) and dilute nitromuriatic acid (♏v.) may be prescribed in glycerine and water for a child seven years old.

Topical applications are numerous. I always use equal parts of liquor ferri perchl. fort. and glycerine applied to every accessible part by means of a camel's-hair brush. A solution of ten grains of nitrate of silver to the ounce of distilled water may be mopped all over the pharynx and on to the epiglottis when the cough is very obstinate. The cough

may also be treated as described on p. 196. If the growths be large, and do not yield to the whole treatment above indicated, the galvanic cautery should be used by the surgeon. Some prefer the application of strong caustics, such as the solid stick of nitrate of silver. Whether the thermo-cautery or the caustic be used only a few growths should be attacked at one sitting, and care should be taken that the child has not to go out into the cold damp air afterwards. It is best to keep him or her indoors for a day or two after this surgical treatment has commenced.

CHRONIC HYPERTROPHY OF TONSILS.

Sometimes the tonsils are large and soft; sometimes they are less large, but scarred and ridged by fibroid changes. They may meet in the middle line, and rub against one another till ulceration occurs. Such enlargements cause the nasal bridge to shelve and flatten out, and the lower parts of the thorax to fall in so often that deformity results. Transverse and lateral constrictions or true pigeon breast may result.

These children are often wasted and pale, and very liable to suffer from constipation or diarrhœa. The mothers often say that they come over "so pale, so ghastly white."

Snoring at night time and nasal voice during the day are observed. The mouth is kept open, and the expression has often an imbecile look. This is due partly to deafness.

Treatment.—The tonsils should be excised, but not if any acute inflammation be present. This should be treated first by gargles and tonics.

Debility, deformed thorax, incessant coughing and thoracic disease are signs for urging the excision of the tonsils. Large tonsils not producing these signs in children a year or so before puberty, need not be excised. The tendency for en-

largements to disappear with the accession of puberty may be remembered.

Change of air and scene, exercise in the open air, gymnastics, massage, good nourishing food, attention to bowels and digestion, cod-liver oil and steel wine (see Scrofula, p. 63), are the general therapeutic measures. Would long discussions increase the expression of my sense of the great importance of these agencies I would willingly enter on them. Nothing is of such vast importance as seasonable *clothing*. In doubtful weather the whole surface of the body, but especially the neck, chest and arms must be covered with woollen raiment. This applies to all affections of the throat.

Painting the tonsils with equal parts of liquor ferri perchl. fortior. and glycerine may be done twice a day with a camel's-hair brush. Some paint the tonsils with Lugol's solution of iodine dilute twice or four times with water. Others use nitrate of silver gr. x. to ʒi. of distilled water. A stick of nitrate of silver just to whiten the surface of the tonsils has also been used. Daily counter-irritation with tincture of iodine about the angle of the jaw is valueless. *Powdered alum* applied by the finger to the tonsils once or twice a day to keep down enlargement may be used instead of painting with glycerine and iron. Adenoid growths should be treated with the *galvano-cautery*. One or two may be burnt daily. *Excision* may be performed with vulsellum forceps and guarded bistoury, or with one of the many forms of guillotine. The local and general measures should be persevered in after their removal. Cold and damp must be avoided, as the tonsils undergo continuous enlargement without inflammation under their influence. The neck should be protected by a wrapper of flannel or wool, especially when going outdoors.

The *tickling sensation and resulting cough* in the throat

may be relieved by mopping the fauces and pharynx two or three times a day with a four-per-cent. solution of *cocaine* or with glycerine of tannin.

The rickety state and strumous diathesis are causes of hypertrophy. Alkalies of carbonate of soda gr. iii., potash gr. iii., or liq. potassæ ♏iii., may be given three times a day in struma ; and iodide of iron ʒss. or syrup of the phosphates ʒi. for children seven years old. *Arsenic* may be used (see treatment of Rickets and Scrofula).

Gymnastic exercises are very valuable in removing deformity of the chest. The horizontal bar and Adam's inclined plane or the trapeze may be used indoors, but not in a dusty room. The ordinary drill exercises are also efficient.

Dupuytren recommended the child to stand with its back against the wall, and then placing the hand on the most prominent part of the sternum, to press firmly upon it during each expiratory effort, relaxing the pressure during inspiration. The best way of treating deformity is to prevent its becoming chronic by advising removal of the tonsils. It is no argument against excision that the hypertrophy recurs.

The apprehension that the genital organs will atrophy if the tonsils be excised is admitted on nearly all hands to be groundless.

TUBERCULAR ULCERATION OF FAUCES.

It is not easy to distinguish at first sight syphilitic from tubercular ulceration, unless the case has been seen from the first. All the cases, three in number, that I have seen were already very extensive, and involved fauces, palate and pharynx.

Syphilitic ulcerations are generally deeper, with sharper-cut edges and there is a tendency to fibroid scarring owing to the vascularity of parts of the syphilitic infiltration. The tubercles break down at one part, and grey granulations, more trans-

lucent, are seen around the ulcerating areas; the edges of the ulcer are rough and nodular and the base shallower than in syphilis.

The cervical glands are enlarged in both diseases, but perhaps more in the tubercular variety. Fever may be present in both ulcerations, but the hectic type of fever is in favour of tubercle; syphilis may be altogether afebrile; tubercle hardly ever so. The diagnosis is aided by the personal and family history either of syphilis or tubercle. If there be signs of breaking down in the lungs, that is almost certainly clenching. A large spleen may be tubercular or syphilitic. Lastly, syphilis and tubercle may coexist.

At the outset the disease may be mistaken for tonsillitis, owing to the pain and dysphagia; for diphtheria owing to the whitish spots when the disease begins, as well as to the fever, pain, and dysphagia; and for herpes of the pharynx (Percy Kidd). A great feature of the cases is an enormous amount of viscid mucus and muco-pus that obscures the ulceration, and wells out of the mouth and nose.

Deglutition is very difficult, and regurgitation of fluids occurs through the nose. The patient must be fed with the naso-gastric tube, the diet and hygiene must be regulated by the tuberculosis of other organs which always exists. Death is certain in this disease, though not necessarily from the throat condition, which usually, however, only appears a few weeks before the fatal termination.

The general principles of **treatment** consist in the administration of *nourishing food*, pounded meat, eggs, milk, and stimulants—by the nasal tube at regular intervals; and by attention to local antisepsis. *Syringing*, *spraying*, *swabbing*, and *gargling* of the throat with nasal douches may all be practised with a view to reducing the amount of secretion and the degree of the stench. Any of the antiseptic applications used in diphtheria may be tried. The distress

and misery may be relieved if necessary by opiates—Pulv. Ipecac. Co. gr. x. to a child five years old. Finely-powdered iodoform blown on to the surface and into the nose by the insufflator does good. The child should sleep on its side to prevent choking and disturbance from the secretions, and to allow of their ready escape.

HERPES OF PHARYNX.

Sometimes pharyngeal herpes complicates labial herpes, but not always. The complaint consists in the development of a crop of vesicles, somewhere on the fauces, usually on one of the pillars. The vesicles are seated on a hyperæmic base, and there may be some swelling. The glandular enlargement at the angle of the jaw on that side is trifling. The disease may be mistaken—probably often is—for diphtheria, because the vesicles soon become macerated, and get to look like exudations. When they burst slight shallow ulcers are left.

The complaint is attended with slight fever, 100°-101°, with thirst and often with much discomfort; pain shooting up to one ear, as in tonsillitis, is common. There may be fœtor of breath and salivation.

Treatment.—A dose of castor-oil, or, if the tongue be much loaded, calomel gr. ii. and pulv. jalapæ co. gr. vi., for a child seven years old may be prescribed.

Chlorate of potash gargle, gr. x. to ʒi. should be used frequently, or sprays of *sanitas* with Seigle's apparatus, or *carbolic acid*, 1 in 100, if gargling is not possible. Fœtor would need the use of garglings and sprayings more frequently. As a rule the fever subsides after the purge. *Aconite*, drop doses of the tincture every half-hour, may be given to abate it, if necessary. Five drops may be given at these intervals, then every hour for two or three drops, and then every two hours for a few drops more—a dozen drops for a child five years old should not be exceeded.

Cold wet compresses, or hot fomentations, or rubbing the neck behind the angle of the jaw with a little chloroform and opium liniment, may be used to relieve the pain; thus:—

R Tinct. Opii, ʒii.
Chloroformi, ʒii.
Lin. Camph. Co., ʒiv.
Lin. Saponis, ʒi.

The child should be kept in one room, with plenty of cubic space and ventilation, out of draughts; on a liquid diet of mutton broth, beef tea and milk for a day or so. Ice may be sucked to relieve morbid sensations. Stimulants are seldom necessary. A grain of quinine disguised in glycerine is the best medicine. Dr. Morell Mackenzie recommends *Fowler's solution*, three drops three times a day with the food to a child four years old. I have not used it, and it was unnecessary in the six cases that I have seen. A camel's-hair brush charged with five-per-cent. solution of cocaine will generally relieve distressing faucial sensations, if applied neatly to and around the painful part.

CHAPTER XII.

ABDOMEN.

The belly in infancy and childhood is of larger the adult. This is owing to several causes. Me made of three chief reasons—the smallness of th of the pelvis, and the large size of the liver. T most important part of the organism in childh therein are contained those organs which supply to the rest of the body, and for the growth especially. In later life the brain, respiratory organs assume a greater activity, whilst the der abdominal organs are less.

Physical examination.—Palpation is the most Inspection also gives information. Percussio value. Auscultation rarely teaches much. Th be examined when the walls are lax. This rel be secured somehow. Sometimes it is best wi sitting up. But infants may be quiet when la backs in the mother's lap. Older children w couch, and the knees may be drawn up and made with the mouth of the child open, as in th

The size of the belly may be increased: (1) (acute or chronic tympanites); (2) from fluid other effusions); (3) from tubercular disease and

Abdominal Tumours.—*The liver* may be gre from disease. It may be the seat of active con ciated with gastro-enteric catarrh and of passiv congestion from heart disease. Lardaceous dis the liver. Fatty livers are also met with i kets and syphilis may cause enlargement

Hydatid disease and new growths occur in the liver. *The spleen* may form an abdominal tumour. Syphilis causes the spleen to enlarge. I doubt whether pure rickets ever does, though most physicians assert this. In so-called lienosus the spleen may form a considerable tumour; this may be accompanied or not with leukæmia. Lardaceous or waxy disease increases the size of the spleen. I have seen hydatid cysts in the spleen in a child aged three years. *The kidney* is not unfrequently the seat of malignant disease, nearly always sarcoma. Hydronephrosis, pyonephrosis, and cystic disease are met with in children. A psoas or iliac abscess may form an abdominal tumour. *The mesenteric* glands may be the seat of tubercular enlargement and disease (tabes mesenterica), as well also of new growths (lymphadenoma, lymphosarcoma). *Tubercular peritonitis* causes swelling of the belly, with scattered indurations or lumps, collections of fluid even ascites and tympanites. *Sarcoma of the large bowel* must also be borne in mind.

Ovarian disease also occurs in girls, but not frequently; it is usually malignant. *Abscesses in the abdominal wall* may simulate abdominal tumours. And there are such things as "*phantom*" tumours even in children.

ACUTE GASTRIC CATARRH AND GASTRITIS.

This chapter must be regarded as a further development of that on Indigestion and Dyspepsia—simple gastric catarrh. It is inferred that simple gastric catarrh exists in indigestion and dyspepsia, but this may be so slight as scarcely to deserve a designation signifying inflammation. I wish briefly to draw attention to more severe degrees of gastric catarrh, such as may be due to bad feeding and cold-catching in partially devitalized protoplasms; but also to cases where a more powerful irritant has been at work—very hot or cold water or foreign substances such as chalk, coal, alcohol in some quantity,

or sauces, and lastly arsenic, antimony and mineral acids. The arsenic may be inhaled from wall papers, which should never be allowed in anyone's rooms. The symptoms are simply more violent than those given under Indigestion. *Nausea, retching, vomiting, pain*, and *epigastric tenderness* may be severe. There is a greater tendency to *collapse*, sunken eyes and dark areolæ, with empty, anxious, bloodless face. Of course these are matters of degree; they may be more or less marked, according to the strength of the irritant and the feebleness of the child. Thirst is urgent and appetite lost. The vomit may be coffee-ground-like, or contain blood and bile along with mucus. There is usually fever, and this may be as high as 104°. The nervous prostration may be seen as great restlessness at night and marked drowsiness at day-time, unless there be complete collapse. Collapse may pass into coma with its peculiar vigil, its hollowed eyes with unduly exposed sclerotics, empty moist skin, and small or absent radial pulse—symptoms indicating the near approach of death.

Gastric catarrh, if attended with fever and diarrhœa, may simulate typhoid fever so as to be undistinguishable from it. Typhoid fever may last only fourteen days; there may be no spots, no decided enlargement of spleen, no distinctive stools, and a little bronchitis may occur with gastric catarrh. If there be a cause for the gastritis, and if there be no other cases of enteric fever about the same time or in the same neighbourhood, the diagnosis will be aided.

The **treatment of gastritis** is conducted on the same general principles as indigestion. *Emetic* and *purgative*.—The stomach must be emptied and the bowels cleared as recommended on p. 42; but in great collapse these should be prohibited, or given with stimulants and caution. *Aperients* of calomel gr. ii., compound jalap powder gr. x., or better, jalapine gr. ii. Tamar indien may be used instead of oil.

Useful *laxatives* are syrup of senna ʒi., Martindale's pastils of cascara sagrada; capsules of Gregory gr. x., fluid magnesia ʒss., confection of senna ʒss., and sulphur ʒss., for children seven years old.

Of course the child will be kept in bed, and every care taken to keep it warm and to see to the ventilation. A mustard plaster for ten minutes over the epigastrium, or frequently renewed hot linseed poultices, care being taken to avoid chill, or spongiopiline or hot fomentations may be applied as *counter-irritants*. The great thing is to leave the stomach alone and at perfect rest. Vomiting must not be allowed to continue. It may be controlled by iced water, iced brandy, or champagne, and by opium—Dover's powder, gr. i., repeated frequently, or morphia under the skin, gr. $\frac{1}{10}$ for a child three years old. If due to a mineral acid the gastritis may be locally relieved by a leech or two at the epigastrium, followed by fomentations.

Nutrient *enemata* of peptonised meat, milk and gruel, or a peptone suppository (Savory and Moore), may be given if the case be severe, and especially if the child be a few years old. If food be permitted, then small doses (even a teaspoonful) of cold whey, cold koumiss, cold mutton broth, veal tea, or what not, will suffice, with brandy and champagne should the feeble pulse or collapse indicate their employment. Sucking small fragments of ice or pounded ice will relieve thirst. Cases that are so collapsed as to need hypodermic injections of ether (mx.) rarely recover. Hot baths with a little mustard may be used. The alkaline carbonates of soda (gr. vi.) or potash with subnitrate of bismuth (gr. vi.) may be given with mucilage in cold water, and a drop of dilute hydrocyanic acid added thereto.

Great care must be taken to keep the extremities of the child, and also the whole of its surface, warm. The belly should be swathed in flannel, and the chest also; the limbs

may be enveloped in cotton wool, and hot bottles placed near, not in contact with, them. The internal temperature may be high. If there be extreme collapse, cold baths must be out of the question, but a cold pack may be employed if the internal temperature of the rectum transcend 104°; but there may be need for free stimulation as indicated by the pulse, the heart and depressed fontanelle in infants. When recovery is taking place the food will have to be regulated with great nicety. Raw meat juice diluted and pancreatized foods in small and frequent doses rather than large and at long intervals may be used. Cow's milk, arrow-root and sugars should be avoided. Whey is better, and the albumens must not be allowed to form large clots in the stomach. A peptone suppository (Savory and Moore) may be placed every six hours in the rectum.

Should recovery ensue, *tonics* are needed to round off the case. Tinct. of nux vomica may be added to the alkali. Mineral acids may be given with bark; see p. 298 for many tonic formulæ. The various syrups are useful, though some object to saccharine tonics. Syrup of phosphates of iron and lime ʒi., or Easton's syrup (ɱxv.) of iron, quinine and strychnia, or Lorimer's compound syrup of the hypophosphites (ɱxv.) may be prescribed for a child seven years old three times a day.

SEVERE OR INFLAMMATORY DIARRHŒAS.

Under this heading I shall deal with at least three different sorts of severe diarrhœa. In all of them it is necessary, if possible, to remove the patient from the locality in which the disease was contracted, to see that abundance of fresh cool air and light are supplied; to substitute comfort for the discomforts of poverty, should the child be of poor parentage as so often happens; to attend to the diet and drink. The great heat and drought, with the usual attendant circumstances

of summer in populous cities and large towns, from which defects of drainage and sewage and decomposing organic matter of animal and vegetable nature are seldom absent—are all proven causes of these diarrhœas. Therefore if it be possible the child should be removed to some distance from the city, and to a place where the sanitation is perfect, where no bad smells from defective drains or unguarded cesspools impregnate and pollute the atmosphere, soil, water and food.

These directions apply not only to children who are ill already, but also to children generally. I have strongly insisted on the importance of all children under the age of seven years not living in large towns or crowded cities. Again, the country seat should be well drained and free from excessive humidity. And this should be so because there are grounds for believing that some of the diarrhœas own a *malarial* or a *septic* cause, and moisture of a certain degree favours the growth of such causes.

All children are not equally liable to suffer from severe inflammatory diarrhœa. Those that are ill-cared for in any way, especially the hand-fed; those that are already debilitated; those that are the subjects of actual disease, like rickets, scrofula, heart disease, bronchitis and cirrhosis of liver, are more prone to develop these severe diarrhœas.

Again, repeated cold-catching, bad feeding, and constant ingestion of impure water, are most potent agents in developing that state of body and of bowel in which these severe diseases delight to occur. All these causes appear to be more effective in the hot months — like thrush, stomatitis, indigestion, simple diarrhœa, simple catarrh. Again, the younger the infant, the greater the liability to suffer; the more severe the disease; the greater the mortality; the more frequent the cerebral symptoms—spurious hydrocephalus and nephritis with uræmia. I believe that the brain and the kidneys suffer together from the anæmia and

toxæmia and *low* blood pressure attendan
collapse; the effect is of course greater t
vitality, and therefore *cæteris paribus* t
infant. If the reader has already read t
general hygiology (so far as concerns clot
exercise), nothing further need be said he
phylactic treatment of these summer diarrhœa

Of the **summer diarrhœa** mostly of teethi
is well called **cholera infantum** and **choleri**
I may recall its principal symptoms as vo
serous stools, great thirst, rapid tendency t
temperature internally, with nervous irritab
coma and convulsions (spurious hydrocephal
shallow breathing, pulseless wrist, sunken
eyeballs, with leaden-hued areolæ.

The treatment of this diarrhœa must
chiefly carried out by the nurse, who should
capable. Specific instructions should be gi
resolves itself principally into the treatment
Specific remedies have been praised; these w
at the end of the chapter; I can place no
them.

Of course the child will be placed in a
collapsed infant, must be kept thoroughly w
wadding clothes, which should especially be
to keep the abdominal surface at a uniform te
by hot bottles near the body if necessary. The
nearly empty in this disease, so the skin, kidn
liver have but little blood, and do but little wor
is not much blood in the veins if the diarrhœa
have been profuse. If the *collapse* be rapidly
hope must lie in free external stimulation
mustard baths. The indication for these bat
skin and pulse with a cold and blue surface. A

or two of mustard to two gallons of water, at a temperature of 100° F., and for ten minutes, or until the skin has reddened, or the arms of the nurse begin to tingle strongly, is the best method. Or *mustard plaisters* may be used over the heart region, say for ten minutes. *Friction* of the surface of the body with hot water may also be tried. Brandy or liq. ammoniæ in ten-drop doses should be given as frequently as necessary in soda water or iced water; iced champagne is also good. So much for combating collapse.

Vomiting is most difficult to abate, but small teaspoonful doses of iced or cold watery fluids will generally be retained. Too much fluid should not be given, if it can be kept down, in the early stages, for fear of feeding the diarrhœa. The brandy also tends to abate sickness. The excessive *thirst* may be treated by small doses of iced or cold drinks. The best fluids for this purpose are iced water, cold or iced whey, cold thin barley-water, or thin raw meat juice, or thin mutton broth, or weak beef tea, or weak chicken tea, and weak veal tea; some of these will usually remain on the stomach. It is the worst possible thing to give any form of fresh milk, and even the mother's milk had better be withheld for a day or two. The reason is the same as the reason for not giving arrowroot and other starches, the stomach and pancreas are most likely *hors de combat*, and any curd of alkali albumen, even if thoroughly divided, would probably undergo no solution whatever; the same with starches. Sugars, as in condensed milk, would only increase the mischief, because, absorption being almost in abeyance, much of the sugar would remain and ferment.

This is the kind of treatment in severe typical cases. I need not say that the ventilation of the room is as necessary here as elsewhere; all soiled napkins and vomits must be removed as soon as they have been passed by the infant. The napkins should be at once plunged in Condy's fluid or

carbolic acid solution 1 in 40; and every care ta
the furniture, bedding, linen and clothing sweet
the child's skin must be cleaned carefully, and t
well dried and oiled to prevent excoriation.

If medicine can be kept down I always prescr
in large doses:—

℞ Bism. Trisnit., gr. x.
Mucilag. Trag., ℥xx.
Aq. Chlorof., ʒi.

for a child seven months old every six hours.

An enema of five drops of laudanum, in thin
may be injected between the stools; or tinct.
doses may be added to the mixture; but the e
opium should be most carefully watched.

Nervous irritability may be best combated by t
a temperature of 75°-80° F., and this will ser
the temperature also, should there be much i
as is usually the case.

The *wet pack*, or *cold wet cloths*, may be used
anti-pyretic and soothing purposes. The water
be cold (60° F.) if the collapse or emptiness of
of the body be great. A tablespoonful of mus
placed in the tepid bath, and may tend to bring
to the surface of the body.

Many cases of this infantile cholera prove fa
recover, though not if the collapse be profound
after the onset of the diarrhœa; robust childr
likely to recover than feeble ones.

Should recovery be about to take place th
gradually replaced by reaction; absorption of liq
stomach and intestines improves, and the inte
appears; but the feeding must still be carefull
infant may return to its breast, but only at int
six hours—so as to give the gastric and duodena

little to do as possible; the other meals should still be weak and watery and cold. Gradually the diet should be increased in albumens and fats, but care should be had to guard cow's milk with isinglass or barley-water to prevent the formation of large lumps of curd. One part of cow's milk with three parts of barley-water may be tried first. Some cream may be shaken up with the whey, or Mellin's food (soluble carbohydrates) may be given dissolved in whey. Next the yolk of an egg, strewn through thin broth, may be tried—a little at a time, whatever it is. And so the diet may gradually assume the normal, but care should be had, supposing the child to be two years old, not to give much solid food till some days in convalescence have elapsed; too much potato or rice or meat or vegetables or fruits or jams should be carefully guarded against, indeed the child should be considered as an invalid for weeks after an attack. The *prophylactic* treatment, as indicated at the commencement of this section, will be most necessary. Tonics of cod-liver oil and steel wine may be prescribed as recommended on p. 63. The belly surface must be protected by close-fitting woollen clothing.

Of **other medicines** than bismuth and opium there are enough and to spare, but I cannot speak highly of them, for they mostly fail in the severe cases to effect improvement; and in the milder cases it is difficult to say whether nature and other treatment alone might not have effected the benefit ascribed to the drugs; but on this point there must always be some difficulty of decision. If the bowels remain loose after the fever and other bad signs have disappeared, the various *astringents* mentioned in the next chapter may be tried. And all I will say further is that fractional doses of (gr. $\frac{1}{8}$) mercury with chalk; bromide of potassium, in two or three-grain doses, every four hours; a tenth of a grain of nitrate of silver six times a day for pus-like, mucoid and

bloody, as well as serous stools; salicylate of lime in grain doses several times a day; ipe and spirits of camphor in one-minim doses eve dermic injection of nearly neutral sulphate o all been recommended for this diarrhœa. All tioned are for an infant one year old. Dr. speaks strongly of the hypodermic injection employed before collapse has set in. The d small one, gr. $\frac{1}{10}$, for a child a few months ol

A tincture made of one part of coca leave of absolute alcohol has been employed with of a few drops given in water or syrup eve taking fifty to a hundred drops the vomitin and the collapse had abated considerably.

Intestinal irrigation by copious injectior warm water have been employed for infant nitrate of silver one grain to the ounce. As two litres are irrigated by means of an or placed at first so as not to give a high pr ing on the part of the infant is a sign to dis jection.

Dr. J. Strahan speaks highly of creasot iodine $\mathfrak{m}\frac{1}{2}$ Mist. Camph. $\mathfrak{z}$i., every half ho quently if emesis reject it, but it soon stop between this medicine gr. $\frac{1}{12}$ calomel, or gr. is given in sugar of milk gr. iii. or ma diarrhœa abates the medicines are given less milk should be given, but barley water with port wine frequently. He believes with B opium is harmful when the kidneys and live as happens in severe gastro-intestinal catarrh

Resorcine in grain doses has been prescr few months old. It is given in some aromat form, caraway, aniseed). Some give syrup

In that form of severe diarrhœa which is usually called **inflammatory**, the stools are characterised by their changing characters in colour and consistence, but not in odour, which contrast with the simple serous stools of the infantile cholera. All forms of diarrhœa tell with greater force on infants than on children above two years of age. This is expressed in the greater severity of the collapse, fever and tendency to cerebral symptoms. Hence "*spurious hydrocephalus*," with its coma and convulsions, is more frequently seen in infants than children. But the treatment of this severe form of diarrhœa must be carried out on the general lines laid down for the treatment of choleraic diarrhœa:—The ventilation, the bedroom, the clothing, and protection of the belly, the dietary, stimulation by baths and brandy, reduction of fever by tepid baths and wet packs; and the calming of the nervous system by the same means. But this is the form of diarrhœa that is mostly treated with *alkalies*, *antiseptics*, *astringents* and *opiates*, given internally. And all of these classes of remedies are certainly of value. The litmus paper applied to the stools reveals an acid reaction of them, and this acidity is doubtless the outcome of fermentative processes, therefore any agent, whether it be alkaline or antiseptic—and some of the astringents are both alkaline and antiseptic—would tend to prevent the occurrence of fermentation. It will be rememembered that the danger at first is from collapse; and the indications are to combat this as well as to relieve the thirst, subdue the vomiting, and check the diarrhœa. The fever, as ascertained in the rectum, is a measure of the severity of the case; yet in the most severe cases tepid baths (85° F.), with mustard therein, are far more indicated than cold water to abate the fever. If the case be mild from the outset, or when the first brunt of the disease is over, then the time for medicines has come. And I always begin with bismuth and an alkali with opium:—

℞ Bismuthi Trisnit., gr. x.
Sodæ Bicarbonat., gr. v.
Tinct. Opii., ♏i.
Mucilag. Tragac., ♏xx.
Aq. Chlorof., ʒii.

for an infant seven months old, every four hour
taken to watch its effect, for at this age neph
complicate the disease and render drowsiness
develop under the influence of opium. Nev
drop-dose four or five times a day when the
ten or so a day has seldom caused anxiety, th
that necessitates its use necessarily does.
diarrhœa, however, is one that calls for frequ
remedies, and whilst the bismuth may do go
influence may wear off. The hæmatoxylon
then be prescribed :—

℞ Extract of Logwood, 2 grains.
Ipecacuanha Wine, 1½ minims.
Vin. Opii, ♏½.
Chalk Mixture, ʒi.

four times a day for an infant six months old ;

℞ Liq. Ext. of Red Gum, ♏v.
Glycerine, ♏x.
Spt. of Chlorof., ♏v.
Peppermint Water to ʒi.

or this:—

Tinct. of Perchl. of Iron, ♏2½.
Glycerine, ♏xx.
Aq., ad ʒi.

Or these prescriptions may be used in success
those that have given me the best results. Sor
use minute doses of calomel (gr. $\frac{1}{12}$), with
(gr. i.), also Hyd. c. Cret. gr. ½ with the Dover'

have not tried them sufficiently to speak of their value, except in the dysenteric variety. Again, dilute sulphuric acid ♏v., with a drop of laudanum or dilute nitric acid and laudanum, may be tried. The following prescriptions will give a practitioner abundance of remedies should others than those mentioned be requisite :—

℞ Acid Nitric Dil., ♏ii.
Tinct. Camph. Co., ♏iii.
Decoc. Hæmatox., ad. ʒi.

Recommended for diarrhœa with straining and when the stools are green, curdled and contain mucus.

or ℞ Vin. Ipecac., ♏iii.
Sodæ Bicarb., gr. ii.
Spt. Æth. Nit., ♏ii.
Tinct. Camph. Co., ♏iii.
Aq., ad ʒi.

Specially valuable when the stools are abundant, acid, slimy and bloody.

or ℞ Chloral Hydr., gr. i.
Tinct. Bellad., ♏i.
Glyc., ♏xx.
Aq., ad ʒi.

Especially indicated when the child is very restless.

or ℞ Ext. Belæ Liq., ♏xv.
Syr. Gummi Rubri, ♏v.
Glyc., ♏xx.
Aq., ad ʒi.

or ℞ Tinct. of Catechu, ♏x.
Spt. of Chlorof., ♏v.
Mist. Cretæ, ad ʒi.

or ℞ Acidi Gallici, gr. i.
Tinct. Opii, ♏i.
Syrupi, ♏xx.
Aq., ad ʒi.

or ℞ Plumbi. Acet., gr. i.
Tinct. Opii, ♏i.
Syr. Zingib., ♏x.
Aq. Menth. Pip., ad ʒi.

The last prescriptions are most valuable whe
frequent and stools copious. Any of these for
year old four times a day.

Dr. Northridge speaks highly of three grain
acid, two of prepared chalk, and a dram of
every two hours to a child above six months of

Dr. Ryan believes in *belladonna*, which he
arrests both vomiting and diarrhœa. *Benzoate o*
of ʒi. in twenty-four hours, for two days runr
by a purge of calomel and jalap, has been rec
Dr. Guiata. Lemonade and wine should be
If at the breast the infant should be suckled e

As the diarrhœa abates the food may be g
quantities. When the child gets up care sh
that its belly be protected from chills by a
fastened behind, and fitting evenly over the wl
the abdomen, and this should be combine
drawers and gaiters.

The third form of diarrhœa may be terme
from the slimy and bloody character of the
complicate the second form just considered. It
fully as acute as any of the other forms, but it
become chronic and to begin in the milder
known as simple or non-inflammatory diarrhœ

The **treatment** of dysenteric diarrhœa will

as it is acute or chronic. If acute the same methods are to be adopted as in the two previous forms already considered. The dietetic treatment, as well as the management of collapse, nervous restlessness, and fever, should be the same as above directed. Instead of the bismuth mixture, however, I substitute mercury, with or without opium. The opium will be needed if there be much tenesmus and tendency to prolapse of the bowel, as is usually the case. Thus liquor hydrargyri perchloridi ʒss. in Aq. ʒss. every four hours, or calomel gr. $\frac{1}{6}$ and Dover's powder gr. i. every four hours; the powder may be sifted neatly on to the back of the tongue. This treatment suits best in the early stage. A day or two later drop doses of wine of ipecacuanha may be given every hour, or the powder of ipecacuanha in $\frac{1}{10}$ grain doses every two hours suspended in fifteen drops of mucilage, and with two grains of Pulv. Cretæ Arom. These doses for a child twelve months old. Small half-ounce clysters of thin starch or mucilage of acacia containing five drops of laudanum may be injected twice a day if there be much *tenesmus*. Frequent bathing of the perineum and parts around with hot water or hot fomentations, on which a little laudanum has been sprinkled, are very comforting. The cases are rare that need a leech to the anal region. Cold compresses and starch poultices may also be used. For the complete restoration to health after these severe diarrhœas a few weeks at the seaside in a part of the coast free from sanitary defects, with a dryish but not too warm climate, and a course of cod-liver oil and steel wine, are of immense value to the child.

CHRONIC DIARRHŒA.

As has been indicated, either of the two last forms of diarrhœa are liable to become chronic, and may be attended with ulceration of the ileum and lower parts of the descending colon. The symptoms are frequently very variable. Diarrhœa

may alternate with constipation; colicky pa
and be referred, as usual, to the umbilicus;
prolapse of bowel may be present at one time
only again to return. There is usually tende
descending colon, and sometimes in the ri
There may be tympanites and enlargement of
veins. *Tabes mesenterica*, or enlargement of th
mesenteric glands, may supervene. The st
characters considerably; not only may their nu
day to day, but their consistence and colour a
always offensive, and generally contain much
Sometimes hard, pale, rounded bullets of scyb
tion are passed enveloped in bloody slime.
quite watery and brownish, or reddish brown.
like matters may be present, but probably
indicate ulceration, for the blood may com
congested parts. The consistence may be
or thinner gruel. The stools may have the
"chopped spinach," or they may be pale ar
odour is not always that of putrefaction, but
tolerable.

The *diagnosis* of **ulcerated bowel** is often
most reliable signs are the passage of shreds o
exudation and of sooty and tarry matter from
Whether there be ulceration or not there may
or the child may actually increase in weight, b
flabby and liable to profuse sweating. The ner
are important. The child is very restless at
often, and is usually very bad-tempered. Th
usually not raised above the normal, but ther
at times. The tenderness, and perhaps local
the abdomen; the character of the stools, a
aspect of the patient, may suggest *tubercular*
the differential diagnosis is often difficult.

disease in the lungs, or large glands in other parts of the body, would be in favour of tubercle, as would also persistent fever, but none of these signs are trustworthy guides in doubtful cases. The *family history* may be worth something if other children have died of tubercle or with scrofulous lesions. The younger the child the less likely is the condition to be due to tubercle, but this consideration is not of much practical value.

The **treatment** of these chronic forms of diarrhœa consists largely in attention to *hygiene*, to *clothing*, especially of the abdomen, thighs and buttocks, and to *diet*. Immense, indeed, is the importance of keeping the belly surface at a uniform temperature. Carded cotton wool covered with oil silk is efficient. The diet need not be so restricted as in the severe acute conditions. *Vomiting* is not a regular symptom unless there be an acute exacerbation. *Thirst* may be treated by small doses of iced drinks. Raw meat is always to be ordered, but the stools should be daily inspected to see that it is digested, and that too much is not given. Antiscorbutic treatment is important. Greens and most vegetables must be avoided, but one mashed mealy *potato*, with a little salt or a portion of the head of a *cauliflower*, thoroughly cooked and mashed into a purée, may be allowed. *Milk* is frequently ill-borne in these cases, and may be passed in large curdy lumps, apparently unchanged after the clotting in the stomach; but boiled milk or barley water and milk is not always contra-indicated. The stools and the general condition of the patient must be the chief guide. Raw meat juice, preferably from mutton, is seldom rejected by the patient's varying appetite. The appetite must be regulated. These patients are often voracious, and at times have complete anorexia. Strange as it may seem, fresh orange juice or fresh lemon juice in dram doses twice a day is useful in the chronic stage, doubtless as antiscorbutics, though it is not

affirmed that the cases are necessarily due to scur
sugar or much starch (fruits, sago, rice, arrowroo
jams, &c.) are sure to keep up diarrhœa; but lim
ties of these carbohydrates can be digested.

If the child be under one year of age the diet n
beyond the range allowed at that period of life. B
and whey, perhaps milk according to circums
Mellin's food, raw meat juice, white of egg or ye
with water, mutton broth, weak beef tea, will be a s
of foods. It is generally asserted that animal
deleterious in diarrhœa. Used cold in small q
have not noticed any prejudicial effect, and c
number of stools has not appeared to be increase

There is not a royal road to the prescription of
but the methods I adopt are as follows.

If the stools contain much *mucus*, as is usually
prescribe Mist. Ol. Ric. ʒii. four times a day for
years old. If this do not succeed, after a few
then liquor hydrargyri perchloridi in ʒss. doses
a day, or three minims of wine of ipecacuan
added to the castor oil mixture. If the bow
frequently two drops of laudanum may be ad
mixture.

Tenesmus is best relieved by fomentations
region and left iliac fossa, and by warm enema
ʒss., and tincture of opium ɱv., and some ad
Bicarb. of Potash. Red blood in the stools, v
mucus, probably indicates excoriation or ulcer
sigmoid flexure or rectum. Here I greatly bel
medication by large enemata of half-a-pint t
distilled water, in which 10 to 20 grains of nitr
are solved, slowly irrigated into the rectum.
effected by lying the patient on the left side with
raised on a pillow, it should be done some hou

meals. Struggling should not be allowed, and it is legitimate to use chloroform to prevent pain and screaming. This irrigation may be repeated once or twice at an interval of a few days.

Stools frequently and markedly changing in consistence and colour should be treated by half-grain doses of Hyd. c. Creta, with half-a-grain of Dover's powder four times a day. Generally if the castor oil mixture, which is most useful when there is more slime than other matters in the stools, fail, I use mercury, either as the bichloride or as grey powder; ipecacuanha may be added. The absence of bile in the stools is a pretty general indication for ipecacuanha and mercury.

I have tried the various directions indicated by Ringer, and can speak strongly of their general value, but I have seen but few cases in which it was necessary to give the bichloride or the grey powder in minute hourly doses.

The mercurial and ipecacuanha should not to be continued indefinitely. A week or two at the most will yield all the benefit they are likely to afford as regular medicines.

Liquor strychniæ ♏i., or tinct. nucis vom. ♏ii., may be prescribed when matters are tending to mend, as indicated in the better character of the stools, the alteration in the temper of the child, the better sleep and less sweating. Liq. arsenic ♏ii., and ferri et ammoniæ citratis gr. ii., with a few drops of rectified spirit in two drams of water may be prescribed, also under similar circumstances, three times a day for a child two years old. The iron and the arsenic influence for good not only the general nutrition but the bowel condition. It may be necessary to prescribe, just before meals, the Mist. Gent. Alk. ʒii., with tinct. nucis vom. ♏ii., to promote or regulate appetite and digestion. Some prescribe Liq. Ferri Pernit. ♏i., Glyc. ♏x., Aq. Menth. Pip. ʒi. t.d.s. Now and again pancreatized foods of milk, meat and gruel, may be resorted to when digestion fails, as it does at uncertain times.

Small doses of old brandy or high-class port wine may be

allowed with the meals—ʒi. of the former or ʒii. c
for a child two years old.

The stools should be narrowly watched. Ab
fresh air, with perfect hygiene in the *nursery*, ar
indispensable. If there is ulceration, or if it is s
pected, the child should keep its bed.

Oil of turpentine (in ♏ii. doses for a child one y
been advocated for all painful affections of the bo
dyspepsia and enteritis. It is a valuable stimulat
to check bleeding. It disperses wind in virtue
fermentative property.

℞ Mucilag. Acaciæ, ℥iss.
Sodæ Bicarb., gr. x.
Chloroformi, ♏x.
Ol. Terebinth., ʒss.

ʒi. every two or three hours for a child six month

Acorn cocoa, a preparation of ordinary coc
and freed from fat, the soluble parts of roa
without cellulose, and a little sugar and roast
been highly prized by some in the treatment of
diarrhœa. It may be given in teaspoonful dose
a little cold water, and then boiled, whilst const
This quantity may be given three times a d
food and medicine is prohibited for the time.

Further treatment of stools:—

Clay-like and sour—Pulv. Rhei gr. i., S
gr. ii. placed on back of t
Infant six months old.

Later—Pulv. Ipecac. Co. gr. ½, Creta
every four hours.

Frequent and green—Tinct. Opii ♏i., Bis
gr. ii., Cretæ Prep. gr. iii., Mucil
Aq. Menth. Pip., ʒi. t.d.s.

(Astringents, see p. 325.)

Baginsky has recommended *irrigations* or enemata of warm water (half to two pints) containing a quarter to half per cent. of common salt. They should be administered slowly and gradually; their object is to get rid of all irritant matter that keeps up the excessive peristalsis. This method is of special value in the chronic gastro-enteric catarrh, with copious stools containing undigested matter. Should the stools contain much mucus and many leucocytes half a wine-glassful of Carlsbad water three times a day should be given. Thin slimy stools call for astringents (logwood, rhatany, catechu, &c). He thinks peptonized milk of little value. Resorcin 5-grain doses in Syr. Aurant., and calomel gr. $\frac{1}{4}$ t.d.s., are also used.

Semtchenko has used a two-per-cent. solution of resorcin internally with good results in vomiting and diarrhœa in children. The dose should be five minims for an infant a year old, and its effects narrowly watched. One-grain doses of *ingluvin* every four hours with a grain or two of sugar of milk has been tried successfully by Dr. Shelly, U.S.A.

Liquor potassæ in minim doses, with six drops of castor oil and a minim of laudanum, twenty drops of syrup of ginger in half-a-dram of mucilage, given three times a day, has been recommended by Dr. Atkinson in presumed ulceration of bowels with a view of altering the secretions. The concentrated syrup of lactophosphate of iron and lime in water three times a day was used to improve the condition of the blood. Some authors altogether forbid the use of syrupy tonics in intestinal disease. As a rule I have not observed any harm to result from the usual doses.

HÆMATEMESIS AND MELÆNA.

Bright red blood, fluid or clotted, when passed from the lower bowel in children, should suggest to the mind at least four possibilities: congestion, ulceration from any cause,

intussusception, and polypi. Generally speaking, of blood and slime indicates merely a dysenter diarrhœa, associated or not with worms, but he w to think of intussusception and rectal polypi will make a serious mistake. The belly should alwa fully examined when blood and slime, howev amount, are being passed.

The bleeding may be due to purpura or sc specific fevers, and other blood conditions; typh well as dysentery; cirrhosis or acute atrophy chronic lung and heart disease; but of cours of these affections may be found in other parts The treatment of these conditions will be foun Oil of turpentine by mouth or rectum, ice enemata of iced water and astringent enem agencies ordinarily employed to check the bleed

OBSTRUCTION OF THE BOWELS.—INTUSSU

The bowels may be obstructed by simple co fæcal accumulation, by intussusception, and b These are the commonest causes. Other occ are congenital constrictions of intestines, co tumours, strangulation by bands, vermiform Meckel's diverticulum.

Most of the common causes of obstruction elsewhere. Here we treat of intussusception, unfrequent under one year of age, but occu Male infants are more frequently affected than commonest variety of intussusception is that ileo-cæcal valve is and remains the most adva small intestine getting further and further which forms the outermost tube or sheath. P paralysis of the caput cæcum coli, or relative as compared with colicky action of the ileum, i

cause of the invagination. The looseness with which the colon is attached in the right iliac fossa, and the absence of a really distended and fixed caput cæcum coli during the first months of life, may have some share in the causation of intussusception.

The *symptoms* of intussusception are paroxysms of colic with screaming white face and hardness of the belly often relieved by friction; vomiting more or less intense; more or less constipation; tenesmus with blood and slimy evacuations; sausage-shaped or other shaped swelling generally on the left side of the belly. The bowel may be felt by careful examination of the rectum; in examining the rectum, simple prolapse of the bowel, which is often attended with evacuation of slime and blood, must be remembered. Some cases are **chronic** and last weeks, without causing anything more than attacks of griping, vomiting, constipation, and a little passage of slime and blood.

The *diagnosis* has to be made from (1) simple colic, which is impossible in the very early stage; from (2) typhlitis and peritonitis, which is not always easy, though early pyrexia and tympanites and tenderness point rather to inflammation (typhlitic if in the right iliac fossa) than invagination, but when collapse and typhoid state have supervened the diagnosis may be impossible; from (3) dysenteric diarrhœa, or dysentery, chiefly by the absence of tumour, and by the early fever with diarrhœa as well as blood and slime in the motions; from (4) fæcal impaction by the gradual history and careful examinations of the rectum and abdomen—the masses to be felt in the last case are very different from the smooth, even outline of the tender invaginated intussusception; from (5) ordinary hernia by examination of its various localities. It is known, but not sufficiently recognized, that the symptoms of bowel obstruction are largely due to strangulation of the vascular supply rather

than to occlusion of the lumen of the intestine. Two chief forms of intussusception, the **acute** and the **chronic**, should be recognized; in the former vascular strangulation and bowel blocking are complete and sudden, with greater severity of symptoms; in the latter the retardation of the circulation and the intestinal occlusion are not produced rapidly nor completely.

The **treatment** of intussusception is twofold—*medical* and *surgical*.

A sudden *paroxysm* of *colic*, with its severe attendant screaming and whiteness of face, is not always a condition to be treated with purgatives. Such an occurrence should lead to a careful inspection of the abdomen—if possible during the convulsive seizure of the bowel and body, for then the path and termination of the peristalsis may be visible.

It may be *impossible* to *detect* the *tumour* of intussusception at the outset. If the paroxysm be of the severity described, the best treatment is the hot bath, at a temperature of 98° F., followed by hot fomentations under oil silk and sprinkled freely with laudanum; a drop of laudanum must be given every few minutes to a child a few months old till the desired effect is produced.

Purgatives for simple severe colic in infants ought *not* to be given at the very outset; not unless the case is certainly not one of intussusception. It is rare that the doctor sees the patient at the outset. If 24 hours have elapsed since the pain, vomiting, and constipation have set in, inquiry should be made carefully for blood or slime in the stools, for the amount of both constituents may be very large or very small. A careful examination of the abdomen should be made for a tumour, if necessary, whilst the child is under the deep influence of chloroform.

If more than forty-eight hours have passed by without relief of the urgent symptoms the employment of insufflation of air,

injection of oil or water, with or without taxis, in a case of the acute kind, should not be attempted.

There are two paths open, and I should choose the *surgical*, but not neglect the medical. Even if there be a doubt about the diagnosis as between peritonitis and intussusception, the antiseptic surgeon should be called in. It is certain that the little infants cannot stand much rectal insufflation or injection, for their vitality is low, the intussusception often severe, and the collapse of the worst degree. For the same reasons the operation should be performed as rapidly as possible, and the collapse must not be increased by too much spray or carbolic acid. Anyway the infant or child should be kept under the influence of opium, and purgatives never thought of. The bowel may turn out some fæcal matter after the signs of intussusception have begun. This matter may come from the bowel beyond the occlusion, or in the more chronic form some may escape through the intussusceptus.

Taxis must be performed with the greatest gentleness under the influence of chloroform. The belly wall should be lax, and the surgeon should so manipulate the fingers of the two hands as to try to undo the invagination in the inverse order in which it was made by the peristaltic action.

Insufflation of air has been occasionally successful. A small pair of bellows may be used and fitted with a gum elastic catheter by means of a piece of india-rubber tubing. The child should be in a state of anæsthesia, the buttocks raised on a pillow, and patient lying on the back or left side. Care should be taken to prevent the escape of air by keeping the anus closely pressed against the catheter; the nozzle of the bellows has been placed directly within the anus. The air should be equably and gradually injected in good quantity. There is danger of rupture of the bowel by over-distension. When the procedure is proving successful the tumour may be felt to be disappearing along the course of the colon, and the

final reduction is sometimes attended with an audible sound. The injection of warm water or oil, or warm gruel, may be made with a Higginson's syringe, the fluid being slowly, equably, and gradually, but forcibly injected, and the anus kept closed by lateral pressure of its sides against the tubes. The reduction of the invagination may be announced by the passage of a copious stool.

The rectal tube may be connected with an improvised water-cistern or Maw's irrigator placed high above the bed, and thus may be obtained a more equable and forcible distension. Careful control over the tube should be exercised lest too much force rupture the bowel.

The *œsophageal bougie* guarded with a sponge has been employed also in the reposition of the invagination. It could hardly be possible to completely replace an invagination by such means, but Dr. Nissen says that he has cured two cases by its means. Perhaps partial return is effected, and nature may do the rest under the influence of arrested peristalsis by opium. These procedures require considerable caution. Whilst they are being employed taxis may be judiciously practised with any of them.

It is not my province here to go into the methods of performing antiseptic abdominal surgery; I simply insist on its performance in acute cases after the lapse of forty-eight hours from the onset of severe symptoms. Of course opium and fomentations must be used. The latter should be dispensed with when the operation is done. The limit for *mechanical treatment* is placed at forty-eight hours, because after that adhesions will probably prevent proper reposition by such means, and because such means would increase collapse. The *great point is to prevent collapse or loss of vital power.* Hence the necessity for stimulants, and for the avoidance of pain, which greatly reduces vitality. The diet in all cases of intussusception should be carried out

on the small and frequent cold dose principle, and should be always fluid, such as will yield no residue and be absorbed from the stomach and duodenum. Iced water or ice (if the child is old enough), iced or cold whey, cold thin barley water, cold thin beef tea are the kinds of things to order. I am bound to add that some recent authors—Goodhart and others—do not advise early resort to abdominal section even in the acute infantile cases.

What is the *latest date* from the onset of symptoms that abdominal section should be performed? It is difficult to give a good answer to this question, but perhaps six days should be the limit. Extreme collapse and marked typhoid state preclude operation, which must necessarily be attended with a certain amount of shock or loss of vitality.

Occasionally nature cures the intussusception by the sloughing off of the intussuscepted layers. This is attended with the sudden passage of a copious offensive stool and the formation of adhesions between the serous surfaces. This sloughing usually happens after one week has gone by. The necessity for opium and perfect rest need not be insisted on; nor will it be required to enter largely into the reasons why the diet should be of the least possible quantity and of the most digestible quality. Any excess of farinaceous or saccharine articles will be sure to be attended with fermentation and flatulence, which may lead to bursting of the lightly adherent intestines. Therefore potatoes, peas, beans, rice, tapioca, sago, and jams should be prohibited; and it would be well to use predigested food, as the necessary continuance of the exhibition of opium prevents the digestive organs from acting efficiently. Sloughing off of the intussusceptus, perhaps never occurs in infants, but only in older children. The symptoms, as so often happens in infantile pathology, are far more severe and acute the younger the child.

As to the *prevention* of intussusception, the necessity for

careful management of the *diet* is only too evident, for it is probable that slight intussusceptions are frequent during attacks of colic, such, I imagine, as may recover spontaneously. Therefore the guardians of the infant cannot attend too strictly to the principles and practice of feeding as laid down elsewhere. Again, excess of carbonic acid in the blood is said to promote peristalsis, therefore the atmosphere of the room should be pure, and every care taken to let the infant have fresh and cool air. Attention to all other hygienic matters is certainly preventive of intussusceptions.

Being less severe and more chronic, many of the cases in older children subside under the employment of opium. Belladonna is a most valuable adjunct. Tinct. of belladonna ♏x. and tinct. of opium ♏iii. every four or six hours is an ordinary dose for a child five years old. Hot belladonna and opium fomentations may be used also.

WORMS.

Worms are common in children. Symptoms ascribed to them are frequently due to gastro-enteric catarrh. Much mucus is a favourable nidus for their growth and development. They may not give rise to symptoms; but weakly neurotic children may suffer much from their presence.

Various pains, often colicky, and as usual umbilical in situation, are common. Capricious appetite or anorexia, nausea, retching, vomiting, furred tongue, foul breath, constipation, diarrhœa, flatulence, and waterbrash are attributed to them. Scratching the anal region, picking the nose, grinding of teeth, sleeplessness, night terrors, and salivation are frequent symptoms. Headache, giddiness, noises in the ears, squinting, unequal or dilated pupils, lights before the eyes, twitching of limbs, chorea, epilepsy, convulsions, and hysterical phenomena, are included in the category of symptoms. Children who have worms are often

debilitated, pale, and thin. Thread worms may cause dysenteric diarrhœa, with tenesmus and prolapse of bowel and leucorrhœa; and the practitioner should remember that their irritation may lead to masturbation in boys and girls.

TAPE WORMS.

Tænia solium is the adult state of the cysticercus cellulosus found in measly pork. Its head has a snout or rostellum with a double circlet of curved silicious hooklets and four suckers behind.

Tænia mediocanellata is the adult state of the cysticercus mediocanellata found in beef. Its head has neither snout nor hooklets, but four large suckers. The sexual organs are more ramified than those in the proglottides of t. solium.

Bothriocephalus latus is believed to be the adult state of a cysticercus found in fish, whelks, mussels, and oysters. The head has no hooks or snout, but two long lateral grooves or suckers. The segments are broader than long.

ROUND WORMS.

Ascaris Lumbricoides is in shape and size nearly like the common garden worm. Their numbers vary from one to a great many. There are males and females. The former are shorter and curved behind where the sexual apparatus exists. The latter are straighter and thicker behind than the males; the vagina is situate at the junction of the first and second thirds of the body. They reside in the small intestines, whence they may wander into the bile duct and cause jaundice, or into the stomach, gullet, mouth, nose, larynx, peritoneum, vagina or urinary tracts.

THREAD WORMS.

Oxyuris vermicularis is very narrow and short; the males about one or two lines in length; the females about five lines. The head has a mouth and three slightly marked

lips; there is a fin-like vertical membrane above and below. The male is curved behind where the sexual apparatus exists. The female is straighter, and has the vagina at the junction of the first and second thirds of the body (compare with Ascaris). Their chief residence is the cæcum, whence they migrate to the rectum. They are often found about the anus and vagina, and under the prepuce. They exist in large numbers.

The only satisfactory diagnosis of worms is the seeing them in the stools. The stools should always be inspected by the doctor. The naked eye may reveal segments of tape worm, round worms, and thread worms. The microscope may enable distinctions to be drawn between the different kinds of tape worms, and to recognize the ova of the different kinds of worms.

OVA.

The mature eggs of *ascaris lumbricoides* are oval, have a double chitinous and brownish coat with radiate markings, and are about $\frac{1}{600}$ in. in diameter. The ova of the *thread worm* are $\frac{1}{600}$ in. in length, flattened on one side and convex or rounded elsewhere. The ova of tænia solium are spherical, $\frac{1}{760}$ in. in diameter, and have a thick striated shell. The eggs of *t. mediocanellata* are oval, and larger than those of t. solium. The egg of b. latus is oval, brown coloured and has a thin shell, which opens at one end by a well defined lid or operculum. The **trichocephalus dispar** causes no symptoms. As it may be met with, I append a description of it and its ova. It is like a piece of thread, and one to two inches long. The hind part is thick, the front hair-like. The male is smaller and spirally curved behind. The ova are oval, brown, and have a boss at either end.

It must not be forgotten that particles and articles may be found in the stools and urine and be mistaken for worms when they are nothing more than extraneous objects, the

residue of the food or else substances accidentally or intentionally introduced into the dejecta.

Treatment.—Worms, as a rule, like thrush, are epiphenomena. *The first thing is to treat the disorder of the gastro-enteric membrane* (see Indigestion, Diarrhœa, &c.) It is absurd to give anthelmintics unless worms are known to be present, therefore repeated doses of these agencies without worms coming away should not be given.

Anthelmintics for the tape worm.—The anthelmintic should only be given when the bowels have been thoroughly emptied by fasting and a purgative. The child should have nothing but weak milk and barley water or broth all day, and a teaspoonful of castor oil at night. Next morning after the bowels have acted freely (say 7 a.m.) the following draught should be given :—

℞ Liq. Ext. of Male Fern, ♏xxx.
Mucilag. Trag., ʒi.
Glycerini, ʒss.
Aq. Chlorof., ℥ss.

for a child five years old.

A small dose of castor oil may be given three hours later if the bowels have not acted. The fast should be continued on broth without solids till eleven o'clock.

The head of the worm must be assiduously looked for, each stool being kept and carefully examined by freely diluting it, and pouring the mass in small portions on to a large wide flat dish, and microscoping doubtful objects. I have seen the head at least six times.

I do not advise small frequent doses ♏v. of the oil of male fern. Thirty to sixty grains of the powdered rhizome of the fern have been used instead of the liquid extract. The liquid extract may be given in capsules containing fifteen minims in each. Children readily swallow these if they are dropped into the throat with the head thrown back.

A quarter of an ounce of *Cusso*, the flowers and to
Abyssinian plant, has been employed, a teaspoonful
oil should be given two hours after it.

The orange red powder *Kamala* may be emplo
single dram dose suspended in mucilage, gruel, s
treacle. Castor oil may follow it in two hours, but i
unnecessary. Oil of *turpentine* one dram in honey
lage, or in capsules, should also be followed by cast

Petroleum, in a dose of fifteen minims, may be gi
gruel and followed by a purge. *Decoctum granati*
British Pharmacopœia is sometimes effective; it is a
and requires a simple purge after it. Half-an-ounc
dered nut of *areca* may be given, and it needs a
follow, as it is astringent. *Cowhage*, the hairs of
Indian fruit mucuna pruriens, acts mechanically; i
in teaspoonful doses as an electuary, made with
honey or treacle, and followed in a couple of ho
dram of castor oil or compound liquorice powd
letierine, an alkaloid, has been used to expel tænia
teaspoonful of Tonnet's pelletierine solution was p
it contained about six centigrammes (nearly a gra
alkaloid ; the child was thirty-two months old. A
should follow. *Naphthalin* has been given interna
grain doses twice or thrice a day for tænia and asca
the above doses are given as for a child six years o
are rare under this age.

Hygiene.—When the worm has been expelled
hygienic measures should be taken, if the child b
remove any catarrhal state by attention to the diet,
by avoiding excess of sweets, cakes, pastry, and sta
by wrapping the belly and thighs up in woollen ga
cold douches, and by exercise. It should be seen
child takes sufficient salt with its food. The adı
of iron and cod-liver oil should be carried out

mended on p. 63. The exsiccated sulphate of iron is very useful, in three-grain doses, prescribed with glycerine, in relaxed states of the mucous membrane with excessive discharge of mucus. Common salt and ammonium chloride are useful for the same purpose.

Round worms.—In the treatment of round worms the same attention to the hygiene of the body and bowels is necessary. Santonin powder is the chief remedy. Fasting on a liquid diet is desirable, and the bowels should be emptied by a watery purge before the santonin is given. Two grains of santonin may be laid on the back of the tongue and washed down with sugar and water every other night. It may cause vomiting, and nervous symptoms, and yellow vision. The urine, if alkaline, has a bright red colour, which has been mistaken for blood. The santonin may be given in syrup, or glycerine, or lozenges; gingerbread should be forbidden to children. The administration of it in castor oil has been recommended; two grains should be dissolved in half-an-ounce of castor oil, and ʒi. given three times a day. I have tried this. It has often failed; a single large dose is the best, even though it may cause vomiting. It will keep down if given on an empty stomach with iced water. Spigelia is a favourite with some in America. This prescription is recommended by L. Starr:—

Santonini, gr. iv.
Ext. Spigeliæ et Sennæ Fl., ʒiss.
Syrupi, ʒss.
Simple Elixir, to ʒiii. ʒii. t.d.s.

Five drops of the volatile oil of Chenopodium may be given on sugar three times a day. A dose of castor oil will be needed every night for two or three nights.

Sometimes a dose of calomel gr. i., and Pulv. Scammon. or Jalapæ Co. gr. x., will remove round worms. Cowhage and powdered tin have been given in teaspoonful doses,

followed by a purge. Sulphite of soda gr. x. three times a day, with glyc. ♏xx. and chloroform water, is said to be efficacious if combined with a purge of castor oil ʒi. or decoction of aloes ʒss.

Thread worms, more than other varieties, are associated with chronic catarrh of the lower bowel, and therefore the diet, clothing, exercise, cod-liver oil, and iron as described above are even more necessary in the getting rid of worms. Injections are the usual method of killing these worms. Santonin may be given. The vaginal and subpreputial spaces should be examined, and if necessary cleaned. Any substance that coagulates albumen may be injected; each injection should be not more than two ounces. They should be repeated twice or thrice a day. Common salt a dram to the half-pint, infusion of quassia, tincture of steel, ʒi. to the pint of water, solution of castile soap gr. xxx. to Oi., lime water or solution of alum ʒi. to Oi.

An enema of starch and tincture of opium ♏v. to ʒi. may be used to relieve intense distress. Cold compresses are also good; some use hot poultices of starch. These applications may be repeated according to circumstances.

It may be necessary to cure the catarrh before giving special remedies; chloride of ammonium has a reputation here. It may be given thus:—

℞ Ammonii Chloridi, ʒii.
Inf. Sennæ, ʒiv.
Inf. Gent. Co., ad ʒiii. ʒi.

before each meal.

It is most important to keep the bottom clean and dry. Oiling, after thorough drying, is better than dusting with powder to prevent excoriation.

Pruritus Ani.—The anal irritation may be overcome by any mercurial ointment; blue or white, diluted four times, may answer, or a lotion of belladonna tincture ʒi. and dilute

prussic acid ʒss., Aq. ʒii. Eczema, or soreness of this nature attending the pruritus, should be treated by removing all scabs, not using water, but sweet oil, then anointing with a mild mercurial ointment, say very dilute white precipitate, or if this prove too irritant, ung. diachyli. (See p. 283).

℞ Cocaine, 1 part.
Bismuth Subnit., 2 parts.
Lanoline, 20 parts (E. Wende), is also advised.

The parts must be cleaned with oil frequently. Ointment should only be applied on lint (with a perforation) when the bare surface of the sore is exposed by thorough cleansing. If there be a *fissure* of the anus and the above measures be insufficient to effect a cure, forcible distension of the anus may be practised, the child being placed under the influence of chloroform. The well-greased forefinger, or this and the second finger of the practitioner may be used. Extract of belladonna or the ointment of galls and opium may be employed to relieve pain. A dram of bromide of potassium in four of glycerine has also been recommended. Constipation may result from these sores and fissures; the motions should be kept soft or liquid. (See Constipation.)

The *preventive* treatment of worms consists in attention to the general measures to which frequent allusion has been made. Raw meat, especially beef, is a source of tænia; therefore mutton is preferable when raw meat is prescribed. The ova of thread worms are often conveyed to the mouth by children; hence the necessity for constant cleanliness of the bottom and hands, and for the relief of anal irritation. Impure water is a source of worms, therefore children, especially those living in marshy places, should not be allowed to drink well or stream water. All water for children as for adults should be boiled and filtered.

Diet.—Relaxing and fermenting food should be avoided, especially milk preparations, fruits, fatty and farinaceous

substances. Boiled and roast meats, wine and bitters should be advised as tonic and invigorating. A mere change of diet sometimes cures the cases. Broths and soups may be ordered instead of milk and fruits. Gluten bread may be substituted as containing less farinaceous food. Boiled and filtered water is the best drink.

PROLAPSE OF RECTUM.—"PROLAPSUS ANI."

Prolapse may be due to whooping cough or other severe coughing with straining; to screaming in weakly children, especially when constipation is associated with pain from whatever cause (see p. 48); to tenesmus and diarrhœa; ascarides; rectal polypi; stone in the bladder, and other diseases of the urinary tract and to phimosis. Bearing these causes in mind treatment is not difficult.

Posture.—In defæcating the child should lie on its right side, and the stool be received into a diaper; the anus should be supported by pressing together the buttocks, or better, by placing the thumb and forefinger lengthwise so as to support the anal margins during the passage of the motion. The **treatment** for constipation and diarrhœa should be instituted, and any fissures or sores healed by cleansing, and if necessary the application of the solid stick of nitrate of silver. It may be requisite to incise the fissure. *Forcible dilatation* of the anal sphincter is occasionally practised. (See p. 347.)

Enemata in young children often cause screaming during administration, and then the bowel will infallibly descend. It often happens in constipation that if the purge acts whilst the child is asleep the bowel does not prolapse.

Astringent injections in my experience are rarely required. Alum or sulphate of iron, five grains to the ounce of water, iced water, or infusion of rhatany are suitable.

Prolapse due to acute and chronic diarrhœa is frequently relieved by the astringents recommended for those diseases:

catechu, kino, red gum, rhatany, and logwood (see p. 325). They may be used as injections also.

The prolapse should be returned by pouring over it a jug of cold water, and then pressing it up firmly and gently with a clean aseptic soft rag well oiled, placed over the end of the repositing finger inserted into the orifice of the protrusion. If there be tenesmus, a suppository of opium containing gr. $\frac{1}{8}$ may be inserted, or five drops of laudanum in starch may be injected. Hot fomentations to the groin and bottom are also useful.

When *chronic catarrh* is the cause of the repeated diarrhœa and prolapse, remember to use the abdominal woollen binder. Prolapse may occur without the action of the bowels. It is then the result of the alterations of the submucous tissue and of relaxation of the sphincter and should be treated by strapping the buttocks together with a broad layer of strapping plaister, and by the internal administration of strychnia and iron. Attention must also be given to diet, hygiene and clothing.

℞ Liq. Strych., ♏ii.
Tinct. Ferri Perch., ♏ii.
Glyc., ♏xx.
Aq., ʒii. t.d.s.

for a child of five.

ACUTE PERITONITIS.

Peritonitis has the same symptoms, causes, terminations, and treatment in the old and young. In infants, as in collapsed individuals, perhaps it is more frequently latent, or the symptoms not marked. Absence of nervous energy prevents active manifestations of health or disease. In foundling hospitals serofibrinous peritonitis has occurred in epidemics sometimes with pleurisy and pericarditis, or preceded by erysipelas and suppurative umbilical phlebitis. Syphilis has caused intra-uterine peritonitis, and also peritonitis in infancy,

other signs of syphilis being present. I cannot help believing that sewer gas or some septic agency has caused peritonitis in infancy and childhood. I have seen all the serous cavities containing serofibrinous exudation, without obvious cause except that the drains in the house were being repaired. Perforation of the cæcum and appendix is a frequent cause in children some years old; though this form of peritonitis is not common. Typhoid fever has caused perforative peritonitis in children. Tuberculosis may be associated with serofibrinous acute peritonitis. Scarlatina may cause peritonitis, often purulent; the symptoms may be ill defined. Peritonitis may be secondary to pleurisy or pericarditis. Sometimes the stomach perforates with resulting peritonitis. The peritonitis may be localized or circumscribed—as after puncture of hydatid cysts or perforation of the cæcum.

The *symptoms* may be latent. There may be suppression of one or more of the typical signs. *Tenderness* may be absent. Spontaneous pains referred to the umbilicus, and sometimes of colicky character, are generally present at the outset. *Tympanites*, local or general, is rarely wanting. The pulse need not be small and wiry, often is not. *Vomiting* is not constant; it may be absent from first to last. Obstinate constipation is the rule. A certain amount of ascites is common.

Treatment.—Absolute rest in bed; opium internally; counter-irritation and hot moist applications externally; unloading the bowel by small enemata; fluid digestible diet and stimulants—are the chief principles of medical treatment.

The *posture* in bed should be on the back, with the legs raised by means of pillows under the knees, and the head and chest also inclined by the same means. This relaxes all tension. A cradle should be stretched over the trunk to keep off the weight of the clothes. No noise or disturbance should be allowed in the room, because they cause contrac-

tions of the abdomen and increase mental distress. Darkness is generally more agreeable to the child. If possible the room should be so situated as to be free from the jarring of passing vehicles.

A twelfth of a grain of opium powder or drop doses of tincture of *opium* may be given till sufficient effect over the pains and slight drowsiness have been produced. Vomiting may be obstinate. It should be abated by small frequent doses of soda water, iced water or ice with ten drops of brandy. The opium also tends to check it. A $\frac{1}{12}$ grain of morphia may be injected under the skin of the arm or abdomen in a child five years old.

Fomentations sprinkled with a dram of laudanum, covered with oil silk and a layer of cotton wool, may be used; or the flannels may be sprinkled with a couple of drams of turpentine. Some employ cold wet *compresses* well rung out and frequently changed—as in tonsillitis and pleurisy. *Light poultices* of linseed meal often appear to give more relief than other applications, and a little mustard, one part to eight of linseed, may prove an effectual counter-irritant if left on about fifteen minutes. A layer of muslin should protect the skin. Leeches should not be employed on any account in general peritonitis. In perforation the collapse is too great and should not be further added to by depletion; in scarlatinal peritonitis leeching would be absurd, for the patients are generally sufficiently reduced already, and in the septic (?) cases loss of blood ought not to be encouraged.

Tympanites may be relieved by terebene or turpentine in five-minim doses in capsules, or with chloroform water and mucilage or honey, or better, by an enema containing a dram of oil of turpentine. A catheter or long tube passed into the descending colon from the anus and gentle friction or massage of the abdomen, has been recommended, but I should condemn this practice as futile in effect and injurious to the peritoneum.

Collapse may be combatted by the same stimulant
ment, and by such treatment as is indicated at page 3

The *diet* should consist of as much fluid food as
digested; raw meat, milk, and gruel may be predige
Benger's liquors or by pancreatic powders; strong be
milk and barley water, mutton broth, raw new lai
beaten up with water and brandy, the various liqui
essences, veal broth, chicken tea, and the like—may
in small frequent doses. Brandy may be given in the
half-dram doses every two hours, or as the pulse and
aspect may indicate. Iced champagne is very goo
whiskey is preferred by some. So much for medic
ment. But in *perforative peritonitis*, at least, and in t
forms where the pleura and pericardium are not i
and suppuration has occurred, I should strongly
abdominal section by a careful and antiseptic surgeo
peritoneum should be laid freely open, and a most a
and careful cleansing practised with weak Condy's f
water, finishing up with carbolic acid 1 in 40.

TYPHLITIS AND PERITYPHLITIS.

These inflammations mostly result from *mechanic*
tion of the cæcum or appendix vermiformis by co
or foreign bodies. Constipation causes distension of
bowel, and this tells most on the cul-de-sac, cæcum.
mation may spread from the mucous membran
cæcum to the sub-peritoneal connective tissue,
peritoneum. Ulceration may invade as far as th
the other. Ulceration of the appendix leads to p
peritonitis. Sudden pain and tenderness in the r
fossa, with flexion of the thigh on the belly and ha
are the initial symptoms. The pain may not b
to the cæcum; it may be umbilical, or general, o
to the left iliac fossa; the tenderness may be m

Vomiting may be frequent, but never stercoraceous in character. Constipation may be absolute, or scybala and mucous stools may be passed; hardened masses and gurgling may be felt in the right iliac fossa. Perityphlitis causes œdema of the skin, with a patch of redness, and induration may be felt on palpation; fever is almost always present. The resulting abscess may open in any direction outwards or into the bowel. Perforative peritonitis is characterised by a sudden severe onset, and more or less collapse. Typhlitis is prone to remissions and recurrence. Simple typhlitis without suppuration in the connective tissue usually lasts a few days, and recovery is pretty general. Perityphlitis, or perforative peritonitis, are far more serious. *Impaction of fæces* in a distended cæcum may cause pain, some tenderness, constipation, and rarely vomiting; but in genuine typhlitis the pain is of sudden onset and attended with fever. Intussusception may at the outset be diagnosed from typhlitis by the absence of initial inflammation and fever. The tumour of typhlitis is situate in the right iliac fossa. In intussusception bloody and slimy dejecta with tenesmus are almost constant symptoms, and the tumour, if felt, is usually in the left side of the belly. To diagnose typhlitis from inflammation of the appendix is perhaps impossible. A sudden severe onset, with death in two days, is most likely due to perforation of the appendix.

Treatment.—The child must be in bed with the right thigh flexed and supported by a pillow. If the local symptoms are moderate the skin in the groin should be fomented with hot water, dried and painted thoroughly with glycerine of belladonna (equal parts of the extract, glycerine, and water); then hot fomentations under oil silk may be changed every hour. If the patient be robust and the local symptoms severe two leeches may be applied over the inflamed part. The local counter-irritation may be by poultices, mustard

plaisters, or turpentine stupes, but I recommend glycerine of belladonna and fomentations. Cold wet compresses are advised by some. Some recommend painting with five per cent. oleate of mercury, or a mercurial ointment ʒi., ext. bellad. ʒi., glycerine ℥i. Morphia may be given under the skin (gr. $\frac{1}{12}$) for a child of five, instead of opium by the mouth.

Opium and belladonna should be given internally. Five drops of tincture of belladonna and two drops of tincture of opium may be given, say, every hour for three hours, and then at intervals of six hours to a child seven years old.

After the three doses of opium and belladonna the rectum should be emptied by a five-ounce enema of warm soap and water. Purgatives must not be given. Vomiting, seldom troublesome, may be checked by iced water or ice. Restlessness and fever may be abated by tepid spongings. The diet must be low and fluid. Milk should not be given pure; it must be guarded by barley water. Weak beef tea, mutton broth, raw meat, raw meat juice may be allowed. Gruel of arrowroot, or other farinaceous or saccharine articles should be limited in amount. The object is the avoidance of residue and prevention of flatulence. The patient may drink water freely in simple typhlitis. I have great faith in the free drinking of water in this complaint. There is but little fear that digestion will be seriously impaired thereby.

Perforation or persistence of symptoms should be met by stimulants and belladonna with opium. Ammoniated tincture of quinine, in half-dram doses, with glycerine and water, is an excellent tonic. Sal volatile half-a-dram, fluid extract of cinchona three minims, with glycerine and water may be ordered three times a day. The diet must be digestible or predigested in these cases. Assiduous fomentation or poulticing should be the treatment of suppuration unless the employment of the knife is advocated. I advocate the *knife*

for perforation and for abscess. Summon without delay a *careful* and *antiseptic* surgeon, and let the belly be opened in the middle line if there be strong evidence of perforation. An induration with œdematous skin and a red mark thereon I regard as urgent demands for the knife, with free and thorough aseptic lotions, drainings and dressings. Nowadays almost anything can be rendered aseptic, perhaps even the cæcum itself.

The *exploring needle* may be used to diagnose pus and its situation.

The fœtor of the pus may be soon reduced by free drainage and the use of antiseptics about the wound. Iodoform is best. The dressing should be of carbolic gauze, or better, sal alembroth, and a pad of salicylic or iodoform wool over this.

Difference of opinion exists about the *syringing of such cavities*. I have never seen any harm come of it yet. Goodhart advises no interference with the walls of the cavity. If by this is meant no probing or manipulations to get out the pus, I agree. But gently syringing with weak antiseptic fluids appears to be free from the objection that obtains to washing out the pleura, for the cavity resulting from typhlitis may have irregular walls, but is seldom very large, and, moreover, is surrounded by the softer belly wall and intestines.

The principles of **treatment** of typhlitis then are the prevention of irritation from within, and from without by rest belladonna, and opium, and the avoidance of purges that act on the muscular coat, and of food that causes flatulent distension. Free drinking when there is simple typhlitis tends to soften fæcal accumulations.

No authors advise strong purgatives, but some see no harm in the administration of saline purgatives whilst the peristalsis is paralysed by the free use of opium.

Sulphate of soda (ʒss.) and comp. extract of colocynth (gr. ii.) may then be given frequently with opium (gr. $\frac{1}{8}$)

for a child five years old. I should not advise this method, but it seems conceivable that it should do no harm and might do good. I think free drinking would accomplish the same purpose.

Large enemata are also advised by some. All parts of the intestine sympathise with one another. I cannot help thinking, therefore, that the peristalsis evoked by a large enema may be accompanied by a tendency to violent action of the neighbourhood of the cæcum also, and this might be dangerous in some cases. The enema should be used simply to empty what is in the rectum and sigmoid flexure.

Mercury should never be employed at any stage. It is recommended by some to start the treatment with a calomel or blue pill. It causes too violent peristalsis. We do not use mercury in inflammations nowadays. And here, if anything, it would promote absorption of adhesions, which is obviously undesirable. Adhesions are not likely to be formed unless there be a natural necessity for them.

Preventive treatment of recurrence should be carried out by attention to the diet; by daily exercise; diurnal evacuation of the bowels, and other measures that promote regular peristalsis and general health; tonics of quinine and nux vomica or strychnia, massage, especially of the belly, along the colon in the direction of peristalsis; and by a cold douche every morning (see p. 149).

TUBERCULAR ABDOMINAL DISEASE; TUBERCULAR ULCERATION OF BOWEL, DISEASE OF GLANDS AND PERITONITIS.

All these conditions may coexist, or any two of them may be associated, or each may occur by itself alone.

Ulceration of bowel is very difficult to diagnose with certainty. It has no pathognomonic signs. The frequent passage of dark clots of blood, tarry or sooty matter, and shreds of

membrane or exudation, with variable diarrhœa of remarkably changing characters, are the best indications we have of its occurrence.

It is difficult, also, to diagnose with certainty the tubercular enlargement of mesenteric glands (Tabes Mesenterica), *i.e.*, we cannot always be quite sure that what we take to be a gland is not a plaque of tubercular infiltration or fæcal matter.

There are pathognomonic signs, however, of chronic or tubercular peritonitis. They are indurations and abscesses.

The *symptomatology* and *course* and *termination* of all three diseases present many points in common.

The *onset* in all is usually gradual, but sometimes sudden; the course in all is usually interrupted and remittent rather than continuous and definitely terminating. The termination in all may be recovery or death. The duration likewise is measured by weeks and months.

Recovery from tubercular peritonitis is common, from ulceration probably rare, from true tabes occasional. The recovery, however, is usually imperfect in all; the child remains weak in some way—either debilitated, or anæmic, or thin. Occasionally the health becomes as good as it was before the illness. The first symptom of these diseases varies as much as does the combination of symptoms met with in them. Tenderness, colicky pains, and enlargement of belly are common local symptoms, and emaciation, anæmia, debility, and low spirits are common general symptoms. Loss of appetite, thirst, vomiting, and fever may or may not be present. They usually are met with at some period or other in the course of these diseases. The belly swelling is usually due to tympanites (gaseous distension).

In peritonitis, and perhaps tabes, there may be water-ascites. Both tympanites and ascites may be slight, moderate, and occasionally excessive.

The bowels may be shut for days together, even with

ulceration; on the other hand, there may be profuse diarrhœa. Rarely the chronic form of peritonitis starts suddenly with cholera-like intensity, diarrhœa, vomiting, collapse, algidity, and tympanites. Diarrhœa, occasional or even more continual, is no proof by itself of the coexistence of intestinal ulceration (Gee). I can corroborate this from my own experience in the post-mortem room. Recurring attacks of diarrhœa and recurring attacks of constipation, or even complete obstruction, are frequently observed in ulceration and peritonitis.

"The indurations of chronic peritonitis may have the form of bands and patches or of lumps and knots. They are certainly present in most cases at some period or other of the disease. They begin to appear within a few weeks of the onset of the illness. They are more or less obscured by the coexisting tympanites, and for this, or some other reason, they are not felt equally well at all times in the same patient. When the abdomen is very tender or resisting, I usually administer chloroform to the child before proceeding to the examination, and I strongly advise you to do the same in a doubtful case. The bands are commonly transverse, stretching right across the belly, or confined to one side of it. They are felt above the navel, on a level with the navel, or below it —for instance, parallel to Poupart's ligament. They are sometimes remarkably hard. They are mostly about the breadth of a finger, or more. The *patches* of induration, like the bands, may be met with anywhere. The lumps and knots are sometimes very numerous; sometimes there are only one or two. Their size is very different, they often feel like nuts or pips. They differ very much in situation; there is no rule in these matters. The distinction (not always possible) between peritoneal and glandular lumps is to be found in the fact that the former are, as a rule, more superficial, less deeply seated than the latter.

"Suppuration—discharge of pus from the navel, due to a local peritoneal abscess—is likewise characteristic. Sometimes there is nothing more than an appearance of pointing, which afterwards subsides, and never goes on to discharge. The navel looks red and swollen, not merely protruded, but its tissues swollen (caput medusæ). This sign I believe to be no less characteristic. The pus is sometimes mixed with fæces. This is a condition which indicates ulceration of the intestine, and is a very much more dangerous affair than the discharge of pus alone" (Gee). Every word of this realistic description I can confirm from personal observation. A shiny, tense belly, with large blue superficial veins and swelling of some inguinal glands, may occur without much ascites. Sometimes a doughy feeling of the belly with but slight resistance to palpation, and without local indurations, are the only physical signs.

The **treatment** of tubercular ulceration of the bowels should be conducted on the lines laid down at p. 329 for chronic ulcerative diarrhœa. All three above-mentioned conditions may be associated, when the treatment should be managed on the following principles:—

Absolute rest and immobility of the *body and belly* of the patient; *perfect uniform woollen* clothing of belly and body; *treatment of symptoms; regulation of regimen.*

The child—usually in the second period of dentition—must be confined day and night to bed. Care should be taken that the room is thoroughly ventilated without the child being exposed to draughts. The *instant disinfection* and *removal* of stools is necessary. And of all soiled bed and body linen. The bedding must be kept sweet and clean. It is well to have two beds and two rooms. In changing the patient, the belly must not be jolted. Any movement or disturbance of the abdomen may give pain, and may increase the mischief. The abdomen should be kept uniformly warm

by a layer of cotton wadding, and a flannel bandage in one layer, fastening behind with buttons; it should reach up to the ribs and down over the hips, and may be kept in position by shoulder straps and perineal bands. Pain of colicky sort may be relieved by hot applications, by opium, and by attention to diet. The application may be light linseed meal poultices, hot fomentations with laudanum thereon, spongiopiline, a flannel bag full of camomile flowers or light bran. The application should not weigh heavily on the abdomen.

If there be œdema and great tenderness, with signs of pointing, glycerine and belladonna paint may be freely used with hot and moist fomentations. If there be an actual discharging abscess, hot and moist boracic acid lint fomentations are better than poultices. Iodoform and salicylic wool are very valuable as absorbent antiseptics. Picked oakum and marine tow are cheaper.

Vomiting and *thirst* may be relieved by small doses of iced drinks. *Tympanites* by a proper dietary and by injections of oil of turpentine ʒss., in warm thin starch ʒss.

Ascites rarely requires paracentesis. If it be the chief symptom, diuretics may be ordered, and the amount of drink restricted. Firmly strapping the belly with strips of diachylon plaister is, I am convinced, excellent treatment, not only for ascites, but in these diseases generally. Resin of copaiva in three-grain doses for a child of seven may be prescribed in Mist. Amygdal. Co., and its effects carefully watched. In some cases this effects wonders. In other cases the vomiting and diarrhœa were increased, and the appetite became worse.

The local *indurations* may be treated by infriction into the skin over them of soap liniment, olive oil or neat's-foot oil, or by painting the skin once a day with five per cent. oleate of mercury.

Constipation should not be overcome by strong purges.

The rectum should be evacuated by a warm enema of about five ounces of thin starch or soap and water, with a dram of castor oil or turpentine. Occasional doses of rhubarb and soda gr. x., or compound liquorice powder ʒss. to ʒi., may be given.

The *diarrhœa* in ulceration is often most troublesome to stanch. *General and local sedatives* may be used. Opium should always be given by the mouth or rectum. Ten drops of laudanum in half-an-ounce of starch, if the latter, and repeated as may be necessary.

Local sedatives.—Bismuth trisnitrate is perhaps the most useful of all drugs. It should be given in large doses. A child of seven may take twenty grains three or four times a day in a half-dram of mucilage of acacia or tragacanth, with two drops of laudanum, and a tablespoonful of chloroform water. Many *astringents* may be tried if this fail. Here are some prescriptions:—

℞ Extract of Logwood, gr. 5.
Tincture of Opium, ♏ii.
Ipecacuanha Wine, ♏5.
Chalk Mixture to ʒiii. t.d.s.

℞ Liq. Ext. of Red Gum, ♏x.
Glycerine, ♏x.
Spt. of Chlorof., ♏v.
Peppermint Water to ʒii. t.d.s.

℞ Diluted Nitric Acid, ♏ii.
Comp. Tinct. of Camph., ♏v.
Decoction of Logwood to ʒii. t.d.s.

℞ Extract of Rhatany, gr. 5.
Extract of Logwood, gr. iii.
Chalk Mixture to ʒiii. t.d.s.

These for children seven years old. (For further treatment, see the several articles on Diarrhœa.)

Small doses of mercury and chalk (gr. $\frac{1}{4}$) with or without Dover's powder (gr. $\frac{1}{2}$) may be used to check diarrhœa, or the liquor hydrargyri perchloridi. They are sometimes prescribed in tubercular disease. Likewise the *inunction* of mercurial ointments or liniments is not much practised. Infrictions of simple oil may promote absorption of the infiltrations that glue the gut together. This may be done in the absence of much tenderness.

Leeches are not used now as local depletives for the pain of tubercular peritonitis.

Heat and dryness of the *skin* may be assuaged by sponging the surface with tepid water. The skin should be cleaned regularly with soap and water every day in all cases.

The *diet* is to be of the most digestible description. The quantity regulated by the powers of digestion and absorption. The stools and the state of the stomach as shown in the absence of pain, acidity, and flatulence, are the guides. Cow's milk may not be digested. It should be given diluted with as much barley water, or isinglass, or gelatine, as will suffice to prevent the formation of large lumps of hard curd. Skimmed milk, or boiled and strained milk, may be better borne. Or the milk may be predigested by Benger's liquor pancreaticus. Or whey may be given. Raw meat, meat jelly, raw white or raw yolk of egg, raw meat juice, and the various liquid meat juices in the market afford a sufficient number of chiefly proteid aliments. Cream or bacon fat as hydrocarbons may be given, according to the state of digestion. Cod-liver oil should be given in minute doses if it do not create nausea, diarrhœa, or other objectionable symptoms. *Fats* may be infricted into the groin, belly, and axillæ. Cod-liver oil is not nice.

As to *carbohydrates*, nothing is better than Mellin's food as a rule. It rarely disturbs the bowels. If the digestion be fair, other starchy matters may be used, but the quantity of

potato, rice, tapioca, sago, and the like must be very small. The starch capsules must be burst by thoroughly boiling. Jams, most vegetables, and sweets should be eschewed in bowel trouble of the changing variety. A mashed head of cauliflower or potato strained through a sieve is a good antiscorbutic. If there be fever, or serious illness, or very feeble digestion, the food must be given in small doses frequently. The food should be cold if there be vomiting or diarrhœa. The food is digested best at those hours of the day when fever is absent. *Stimulants* will also be required under like circumstances. Two ounces of good port or an ounce of brandy may be taken in the twenty-four hours.

When convalescence takes place, the same restrictions in diet are necessary.

Flatulence and acidity are very prone to occur, so that sugars and starches should be of the most limited amount. Malted biscuits or malted bread, or giving an extract of malt in half-dram doses with meals, will aid in the digestion of carbohydrates. The extract of malt should not be rich in sugar, lest it cause "biliousness" and further flatulence. Children of seven have told me that a teaspoonful of the malt extract took away the eyesight a few minutes after it had been taken. Some of these children take malt well when the last chyme is leaving the stomach, and especially if prescribed with an acid tonic; doubtless because the pancreatic digestion is then in full swing.

Reasons for so much regulation of regimen:—Every irritation of the intestinal surface increases congestion, ulceration of membrane, and glandular enlargement—consequently causes less absorption by the lacteals and less power of digestion by the mucous membrane and glands. Every movement of the body and bowel is a further irritation to the peritonitis, and increases inflammation. The quantity of food must not be great. The frequency neither. We want the stomach

and duodenum to do all the work that is necessary. They are seldom ulcerated. Rest is thereby given to the diseased intestines.

Tonics and specifics are most useful when no ulceration exists, or when the child is merely ailing without many belly symptoms. Preparations of iron and quinine may be administered during convalescence. The seaside air in an invalid chair on a fine day should be inhaled as long as possible when the child is well enough to go out of doors.

Iron, iodine, iodides, syrup of hypophosphites, various syrups of phosphates, Parrish's, Easton's, Fellow's, Lorrimer's; iodoform, sulphide and chloride of calcium, arsenic, phosphorus have all been tried. They may be prescribed as directed under Scrofula. Cod-liver oil may be given as there recommended.

CHAPTER XIII.

DISEASES OF THE LIVER.

BILIOUSNESS, TORPID LIVER, SLUGGISH LIVER, AND CONGESTION.

THERE IS a fundamental difficulty in discussing these subjects, because we cannot be sure whether the symptoms in question are due to the liver, duodenum, or stomach. Very likely from over-feeding, improper feeding, insufficient exercise, vitiated atmosphere, and constipation the whole circle of portal viscera is involved. These causes are all I consider here. Congestion may also occur from chronic lung and heart disease. It is seen in the tropics; may be traced to a chill, and occurs in malarial and other fevers. For the treatment of these congestions it is essential to attend to the diseases on which they depend as well as to carry out such treatment as is suitable for the hepatic congestion. The symptoms are the same as in adults: large tender liver, with uncomfortable sensations, especially after the ingestion of food. Slight jaundice is generally seen. Sallow complexion and symptoms of gastric catarrh (see p. 35), &c., may also be present. The mind is usually depressed; as in most abdominal diseases, there is languor and low spirits.

Treatment.—The principles of the treatment of hepatic congestion are obviously the removal of causes wherever possible. Children of the well-to-do, especially at festive seasons, are apt to be over-gorged with food of a highly-spiced and rich description. The heated, vitiated atmosphere of the juvenile ball-room is usually followed by a drive in a closed carriage, with short intervals of exposure to the cold damp atmosphere. Here we have most of the elements conducive to the develop-

ment of a sharp attack of gastro-hepatic congestion. To pass successfully through such an attack the child should be kept in bed on cold milk and barley water, or broth. The *stomach* should be emptied by an emetic such as dram doses of wine of ipecacuanha, repeated every fifteen minutes till complete emesis occurs. The *bowels* should be emptied also by a dose of calomel gr. ii., and Pulv. Jalapæ Co. gr. x., for a child seven years old. Should there be fever and restlessness, the skin may be sponged all over with tepid water, or a warm bath may be given. The *thirst* may be assuaged by sucking ice or frozen milk. This low diet and emptying of the gastro-enteric canal will suffice in a fairly healthy boy to put matters right in a couple of days.

Not unfrequently, however, the "bilious" attack develops out of a long course of indiscretion in diet. The liver and stomach have been kept constantly irritated and hyperæmic by the introduction of too much food, too frequently given, perhaps too highly spiced and irritating. Further, the liver may have been overloaded and the blood surcharged, because the child has not been out of doors enough, and because his respiratory atmosphere has not been pure. When the biliousness has developed thus slowly, the course is usually more chronic, but practically the same treatment will serve. The emetic is less necessary. Great care will be needed in the future regulation of the diet. Too much of any of the elements of food should not be allowed. It is a good rule not to allow sauces or condiments to children. Even mustard and pepper are unnecessary for children with normal digestive powers.

The *colour of the stools* is usually clayey, and indicates deficient bile in the intestines; hence the value of rhubarb and soda, both of which substances act on the liver—three grains and six grains respectively for a boy of three. Ipecacuanha, in five-minim doses of the wine, or two-grain

doses of euonymin, may also be given as an hepatic stimulant when the acuteness of the congestion is over, and the stools remain pale.

Irritant purgatives should not be employed to keep the bowels constantly in action. The object is best effected by using simple salts, like the sulphates of soda and magnesia, combined with the rhubarb and soda. Rhubarb is not a purgative proper, it simply increases the activity of the liver and pours more bile into the intestines; perhaps also it increases the activity of the metabolic or metamorphosing functions of the liver.

The *skin* may be acted upon by diaphoretics, such as warm baths or hot-air baths, or actual medicines (liq. ammoniæ acetatis). These are to be used if the free drinking be insufficient to relieve the dryness and heat of surface.

Exercise in the open air and the drinking a quart of bland fluid a day will increase the activities of all the excreting organs—lungs, liver, kidneys, skin, bowels. This will be good treatment for a threatened or departing case of hepatic congestion.

In cases of sluggish liver occurring in *rickety* or *strumous* children tonic treatment will be required. Sometimes there may be no acuteness of symptoms. The child may be habitually languid with constipation, the stools pale, the urine too high-coloured and lithatic, the face sallow, and the furred tongue yellowish also. The diet must be assigned according to the powers of digestion. It is wrong to use powerful hepatic stimulants. The whole body requires tonic treatment, and cod-liver oil and steel wine (see p. 65) will be far better than mere hepatic stimulants. *Massage* and *cold douches* (see p. 149) are very valuable here.

To promote digestion the mixture of rhubarb and soda or Mist. Gent. Alk. with nux vomica are the most suitable remedies, as not being irritant. Sometimes a tonic of nitro-

muriatic acid with quassia or gentian appears to serve better than the alkali. Both alkali and acid are supposed to have a direct action on the liver. Remembering the association with gastric catarrh it will be understood that an explanation, which only considers the liver, of the action of drugs and other therapeutic measures, may readily be at fault.

CATARRHAL JAUNDICE.

Jaundice of catarrhal sort is not unfrequent in childhood, and generally gets well of itself. But it is advisable to restrict the food to the smallest possible quantities, and to get the child to drink bland fluids freely. Distilled water or salutaris water or thin barley water will do. I generally keep the bowels acting—a liquid stool once a day—by means of sulphate of soda and sulphate of magnesia, equal parts, say gr. xv. with a drop of liquid strychniæ*—as often as may be necessary for the effecting of the purpose. This free drinking and maintenance of bowel action cleans the tongue, sweats the skin, increases the urine, relieves itching, and assuages thirst. Appetite is usually not good, and this is not bad for our purpose. A little milk, diluted with barley water, if necessary, to divide the curd, a little white fish—sole, whiting, cod without the skins—dry bread or toast, and small doses of mashed cauliflower and potato may be allowed. Alcohol, fats, and much sugars or farinaceous foods, are prohibited for fear of exciting further gastro-enteric catarrh. If there be much nausea and retching, an emetic dose of sulphate of zinc gr. x., or grain doses repeated every ten minutes of sulphate of copper and warm water, will do good and may dislodge mucus from the common duct.

It is entirely unnecessary to give artificially-prepared inspissated ox-gall (gr. v., t.d.s., two hours after meals). The daily liquid evacuation prevents any ill effects resulting from the absence of bile in the intestines.

* A little powdered ginger covers the taste.

Exercise in woollen garments in the open air in fine weather is very good in jaundice, as it raises blood pressure and promotes the cutaneous and renal functions, but care should be taken in wintry and changeable weather that fatigue is not induced, and that no chill results from standing about whilst the body is heated.

If the skin still itch after what has been done, alkalies may be prescribed in the form of bicarbonate of soda (gr. vi., t.d.s.) or Vichy water, half-a-tumblerful of Celestins or Haute Rive, may be given twice a day. Warm alkaline baths are very serviceable (ʒii. of bicarbonate of soda or ʒii. of borax in two gallons of water at a temperature of 90° F.).

Dr. Edward Kraus and others advocate the employment of irrigation of the intestines for catarrhal jaundice ("Archiv. für Kinderheilkunde," Band viii., Heft 1). A litre or more of cold water, 12-15 R., is injected into the bowel. This procedure is a good one in my opinion. But I should doubt whether it is specially efficacious. Catarrhal jaundice in children subsides altogether, if left to itself, in a week, provided that no actual irritation by unsuitable food is allowed to occur.

CIRRHOSIS OF LIVER.

I know of nothing very special in the nature of cirrhosis of the liver in children. Alcohol certainly has caused atrophic cirrhosis in them. I showed a typical specimen from a girl aged three to the Path. Soc., and am satisfied that the child did drink alcohol freely. Dr. Barlow and others also believe in this view. Perhaps the cirrhosis may result from acute specific fevers. In these fevers an interstitial change has been found. This may endure and grow into a cirrhosis. Syphilis is well known to cause an interstitial hepatitis in children. It may assume the hypertrophic character. I have seen several cases and some specimens of the kind. There is also a pericellular cirrhosis of new-born syphilitic

infants (see p. 80). Interstitial overgrowths also attend jaundice from atresia of the bile ducts—like the experimental cirrhosis of Charcot and Legg. Tubercular disease of the abdomen and general tuberculosis in the child has been associated with interstitial inflammation.

The *symptoms* of multilobular atrophic cirrhosis are identical with those of adults. The early symptoms are those of gastric catarrh and biliousness (see p. 35). The essential symptoms are ascites, hæmatemesis, melæna, piles, swelling of spleen, and enlarged superficial veins of the abdomen; jaundice is ordinarily slight. The liver may be felt below the ribs, and may be tender at the outset. In hypertrophic—unilobular—sclerosis jaundice is intense and an early symptom. But cases may commence thus in children and continue afterwards with symptoms like those of atrophic cirrhosis. We are much in want of further information on the real nature of hypertrophic cirrhosis; whether, indeed, it can be said to have an altogether separate pathogeny is doubtful.

It may prove practically useful to assert that a large ascites, with but slight œdema of the legs, is much more likely to be due to portal obstruction than to any other cause. The peculiar fluid thrill obtained on percussion in ascites is a phenomenon that, once learnt properly from experience, is of the utmost diagnostic value. I have seen so many big bellies set down as ascites which were not of this nature that I feel bound to say that much.

The *diagnosis* of fluid free in the belly turns on the presence of this thrill, and on the change of site of the fluid under the influence of gravitation; but these things are the same as in the adult.

Treatment.—The case at the first outset is seldom to be differentiated from gastric catarrh and hepatic congestion of the chronic, though varying kind; and the treatment should be the same as for those conditions. All the symptoms are

liable to vary from day to day. The causes for this variation are unknown. Even when the diagnosis is assured the medical treatment does not alter. Maintenance of the action of the skin, kidneys, and lungs should be secured by the means described under Hepatic Congestion. It is not necessary to keep the patient abed unless serious symptoms are present. A slight ascites may disappear for a time under the influence of tonics, fresh air, and gentle exercise.

Cerebral symptoms, sudden supervention of more jaundice, marked ascites, melæna, hæmatemesis, and the like, are signs for keeping the patient in bed.

Cerebral symptoms, delirium, restlessness, slow or irregular pulse, drowsiness, convulsions, and coma, often associated with epistaxis and purpura, indicate toxæmia from inefficiency of the metabolism, aided doubtless by impairment of the functions of the excretory organs—skin, intestines, kidneys, and lungs. These organs must be put into vigorous action by hot air baths, by the free drinking of water, by the administration of alkalies and watery purgatives. Treatment is seldom effectual in such cases, or if the symptoms disappear for a time they are prone to recur. Bleeding in such cases may remove the coma, but this generally proves a useless relief.

The *diet* in chronic cirrhosis must be of a nutritious kind, with a moderate supply of albumen—meat, eggs, milk. It should be given in a digestible form—minutely divided and in small quantities at a time. Mist. Gent. Alk., with nux vomica or two to five grains of pepsin, may be given to aid digestion. Alcohol, sauces, condiments, and hot spices or irritants should be prohibited. Fat and starchy and sugary matters must be given cautiously. The powers of the digestive apparatus, as judged by the symptoms and stools, should be the guides as to the amounts of such substances to be ingested. The bowels and stools must be kept in order as recommended under

hepatic congestion. Doses of euonymin gr. ii. or iridin gr. i. are occasionally useful to bring bile into the intestines. Bile promotes pancreatic digestion, peristalsis, and antisepsis or rather relative sweetness of the contents of the bowels. Simple saline aperients—carbonate of magnesia, sulphates of soda and magnesia, phosphate of soda—are the best. The phosphate, ten-grain doses in milk, is specially recommended by Ringer when the stools are pasty and white.

Hæmatemesis or *melæna* seldom demand special treatment. Ten-grain doses of gallic acid or ten-minim doses of liq. ext. of ergot or grain doses of acetate of lead, with a sixth of a grain of opium, may be prescribed, but are in my experience useless. A little powdered opium, or a few drops of laudanum, and absolute rest, with ice to suck, is the best treatment.

Pain about the belly—which with vomiting, sometimes indicates peritonitis—may be relieved by the usual hot applications of light poultices and opium fomentations, hot spongiopiline, mustard leaves and turpentine stupes.

Ascites may require special treatment :—

Diuretics and *tonics*.—The daily use of salines, combined with iron and strychnine as tonics, will often remove a certain amount of fluid.

℞ Sodæ Sulph., gr. xv.
Magn. Sulph., gr. xv.
Liq. Strych., ♏i.
Ferri Sulphat., gr. ii.
Glyc. ♏xx.
Aq., ℥ss. t.d.s.

for a child seven years old.

Iodide of iron gr. ii., or syr. iodide of iron ʒss. t.d.s., or saccharated carbonate of iron gr. v., may be used as tonics instead.

Restriction of the amount of fluid imbibed should be practised as for pleuritic effusion. The resin of copaiva (see p.

258) has so far as I have seen, proved valueless. Infusion of Digitalis in ʒss. doses may be used. Some prefer squills alone or in combination. (See "Dropsy Pill," page 258.)

Paracentesis may be required when the amount of fluid present is large. The breathing is often oppressed by pressure on the diaphragm. The sitting posture may be the best. Considerable tympanites often aids the ascites in causing distension of the abdomen. The best method of paracentesis is to use a Southey's tube, perfectly clean and aseptic, by being kept or boiled in 1 in 20 carbolic acid for some time. The fluid should drain away slowly, and the risk of syncope supervening from sudden loss of tension be thereby greatly lessened. Continuous uniform pressure should be kept up by a carefully applied bandage of aseptic flannel.

The tube may be inserted after a preliminary skin incision through the linea alba, midway between the pubes and umbilicus. The cases are rare that require a more rapid removal of fluid. Repeated removals may be required. In adults, cases of repeated paracentesis for ascites due to cirrhosis have recovered. And the paracentesis should be regarded as a remedial measure. Boracic acid fomentations should be used about the puncture, and everything kept scrupulously clean. Peritonitis is not uncommon after paracentesis. It may be excited by the puncture, but is mostly predisposed to by the macerated and emasculated condition of the peritoneum and patient.

Systematic binding with cotton-wool and a flannel bandage so as to cause even, continuous, and firm pressure, or strapping the belly uniformly and carefully with broad strips of diachylon plaister, so as to produce uniform pressure, may be used from the first to cause absorption of fluid. Or it may be employed after paracentesis.

Infriction of mercurials is a dirty method, and not very successful. The dropsy pill is preferable. The oleate of

mercury, painting daily or every other day with the five cent. solution, is more cleanly.

Acute yellow atrophy rarely occurs in children. I seen recently one case. The liver was felt two fingers' br below the margin of the ribs. There was some anæmi some jaundice. After an occasional epistaxis the male aged twenty months, died with profuse hæmatemesi melæna three weeks after the first noticeable sympt jaundice—began.

FATTY LIVER.

A fatty liver is large, but not very large, painless retention of normal outline and of softish consistence. last fact is of doubtful importance. And the diagnosis u rests on the associations of the liver enlargement. associations or causes are mainly wasting, resulting gastro-enteric catarrh, and especially when this is excess of sugary and starchy foods; or lung disease, phthisis. A want of fresh air, *i.e.*, of oxyhæmoglobi general cause of fatty accumulation. The change is accumulation or infiltration rather than degeneration working protoplasm. Cod-liver oil has been set dow cause. Some cases have been altogether unexplaine by a necropsy.

The treatment is that of the association of the fatt Most careful regulation of diet, with avoidance of ex hydro-carbonaceous material—fat, sugar and star needed for at least two reasons: (1) not to increase i tion, (2) to remove the cause of fatty accumulati restricting the sources of its formation. Hygienic m of the outdoor fresh-air type, with avoidance of chills use of chest and belly protectors, are indispensable. douches and massage should be practised, even if the be confined indoors. Exercise outdoors in a dry b marine climate when the patient is a convalescent sh *ordered* if he can walk.

HYDATID OF LIVER.

There is no difference between this complaint in children and adults. The hydatids may be only in the liver, or they may occur in association with hydatids elsewhere. A remarkable case of Dr. Brailey's had hydatids in the orbit, brain, liver, and spleen. The treatment, whether the hydatid has suppurated or not, is exactly that recommended in every text-book of general medicine.

The liver may be found to be enlarged and painless; a distinct large boss or bosses may be felt. Growth in size is usually slow, and takes weeks or months to appreciate. The bosses generally feel soft and elastic. They may fluctuate or yield the hydatid fremitus, *i.e.*, when three fingers are placed on the tumour and the middle one percussed a regular tremulous vibrating thrill of some duration is felt.

The cyst may *burst* in any direction: outwards, into the lung, bowel, pelvis of the kidney, peritoneum, &c. As a rule, there is no fever and no affection of the general health. Pain signifies peritonitis or pleurisy. Jaundice, ascites, and œdema may occur if the growth press on the bile-ducts, portal vein, or vena cava. Suppuration is usually, not always, indicated by pain, hectic fever, sweatings, and perhaps repeated chilliness.

The *diagnosis* is easy, as a rule. Absence of fever and of deterioration of health diagnoses the enlargement from malignant growths of the liver, which are secondary, as a rule, and so rarely primary as to be a negligable quantity. *Pleuritic effusion* may cause doubts, for upward-pressing hydatids may disturb respiration and cause cough, and pleuritic effusions may cause no tangible symptoms. The exploring syringe may withdraw a highly albuminous fluid if it be pleurisy, and a non-albuminous one if hydatid. A piece of the concentrically laminated ectocyst, or hooklets, or a scolex of the echinococcus, with its four suckers, snout, and circle of curved hooklets may be discovered in the fluid withdrawn.

Suppurating hydatids may be mistaken for empyema.

Treatment.—*Puncture* with the aspirateur is the me that I have seen practised and that I advise. It is well to draw a fair amount of fluid, say a pint if obtainable. I heard of sudden deaths from such operations, but they be rare. The needle and the whole of the aspirating appa should be rendered aseptic by cleansing in hot 1 in 2c bolic acid solution. I have seen urticaria follow this pun in a female child aged seven years. I do not advise *inje* of tincture of iodine (3i. to 3iv. of water), nor the method of ensuring adhesions by the use of caustics the head of the tumour.

The needle should puncture the tumour at its most p nent part. The needle should be of fine calibre, an fluid very slowly withdrawn, as in simple pleural eff so as not to relieve the tension too suddenly.

With our modern antiseptic system, abdominal secti a careful and antiseptic surgeon, would yield in childr in adults, good results; and I should prefer *abdominal* to many aspirations, or to the injection of irritant fluic the hydatid be an abscess, free abdominal section by th stage method is the best treatment, a drainage tube bei in and *lasting* dressings used as far as possible. *Stim* and *nourishing diet* will be needed if suppuratio occurred.

The *preventive treatment* of hydatids is practically sible in England, for we never know how the ova are in Perfect cleanliness of vegetables and other food expo the atmosphere, and the scrupulous washing of the before taking meals, are most necessary. The dog the ova with his motions. The tapeworm of the d four segments only, and the last of them yields the e is only a fourth of an inch in length.

CHAPTER XIV.

URINARY DISEASES.

THE URINE.

It is important always to examine the urine of every child, and especially if the complaint for which it is brought be serious or obscure. The napkins of infants may yield valuable evidence of abnormality; they may be stained with bile or stiffened from pus. The quantity of urine passed in the twenty-four hours in childhood, being dependent essentially on pressure in the renal arteries, is not constant, even in the same child. Any disturbance of blood pressure, as from nervous derangement, gastro-intestinal disorder, or great variation in the perspiration, may either increase or decrease the quantity. The quantity is lessened from want of drink, vomiting, diarrhœa, sweating, from diminished blood pressure, as in heart disease with failure of the myocardium, in cardiac debility from chronic wasting disease, and from diphtheria and acute specific fevers. In general pyrexia the flow is diminished from retention of water in the system, and perhaps from other causes, as weak heart and disordered kidneys. Disease of the kidneys may diminish the quantity.

Polyuria may be due to nervous disorder of central or reflex origin. It may be passing or lasting. It is of frequent occurrence in children. Thirst and frequent drinking, gastro-intestinal derangement, especially if associated with colic, epilepsy, hysteria, convulsions, and ague, cause transient polyuria. Polyuria or diabetes insipidus may result from a blow or fall on the head on the forehead especially, from

meningitis or a tumour about the base of the brain or c
bellum, and from affections of the kidneys and bowels.

The **amount of urea (azoturia)** excreted in childre
usually greater than that excreted by adults during the s
period of time. Even without disease, and without m
concentration, the cold nitric acid test yields frequent
layer of nitrate of urea crystals.

The **urine,** as in adults, should be *acid* and *clear.* It is
too acid and turbid from urates. Indigestion and bilious
(see p. 35) is the most frequent cause of *excessive acidity*
excess of lithates, and uric acid crystals may be dete
The urine is not seldom *alkaline* and turbid when p
from phosphates. This often occurs in wasting and ch
illnesses. Temporary alkalinity may be noticed soon
meals—the "alkaline tide."

Excess of *indican* in the urine may be present from
causes. It often accompanies albuminuria and disease
small bowel—ulceration, intussusception, and severe c
(inflammatory diarrhœas). It may be discovered by H
test. Half-an-inch of hydrochloric acid in a test tu
which three drops of urine and two of nitric acid are a
will be followed by the slow development of a purple c
which gradually disappears. The coloration may be in
The urine that contains much indican often yields
dark ring of pigment with the cold nitric acid test, a
colour of the urine is often a very clear saffron or
yellow.

Pyuria may be due to admixture of pus from the
or vulva. Pyelitis and cystitis may cause pyuria.
once seen pyuria result from the opening of an absce
the pelvis of the kidney in a girl aged seven; the absc
opened into the ileum, and much pus was definitely asce
to be discharged with the urine as well as from the bo

Dr. Gee draws attention to a temporary pyuria, p

due to catarrh of the whole urinary tract. There may be symptoms of cystitis—frequent small, painful micturitions, sometimes unavoidable incontinence; but there may be no symptoms at all, the condition being observed accidentally. The temperature may be high and the child may look ill without any special urinary symptoms.

In cases of presumed cystitis of this description the treatment should consist in keeping the child abed even if there be no sense of illness, but still more if there be fever. The belly should be protected by a flannel binder. The diet must be regulated. For a few days at least a milk diet (milk, milk pudding, a little rice, and bread and butter) should be kept. Even the cow's milk may require division of its curd by barley water, for indigestion may keep up the complaint. Meat and animal broths should be interdicted on the plea that the kidneys would have to turn out more urea and uric acid and urates and thus expose the mucous lining of the urinary tract to greater irritation.

INCONTINENCE OF URINE.—ENURESIS.

Inability to hold the water, or a great difficulty in doing so, and wetting of the bed is excessively common in boys and girls. It may be an affair of the moment or may prove extremely chronic and obstinate, lasting for years. Girls are more prone than boys to the inveterate variety. The chief causes are simple indifference and indolence, a tight or long foreskin, phimosis, adhesion of the prepuce to the glans penis, atresia of the meatus urinarius, or a vascular polyp at the same orifice in girls, ascarides or gastro-intestinal irritation, constipation, rectal polypi, anal irritation from fissure, &c.; acid, lithatic urine from indigestion and biliousness, vulvitis, stone in the bladder or kidney, and finally the *neurotic diathesis* as evidenced by persistence after all treatment, by its occurring in several members of the same family, and by its having

sometimes occurred in the father and mother. The her
may be traced even further back.

The first mentioned cause is, in my experience, a rare
I have not needed, therefore, to prescribe whipping or a
water sousing.

Circumcision is the best cure for the three next ca
(See Surgical Works.) The knife removes the fourth c
and a ligature or touching with nitric acid the fifth.
treatment advised on page 346 will answer for the next t

Rectal polypi may be carefully torn off with the fing
searching the rectum, whose posterior wall they most a
Fissures and sores about the anus will usually cease to
if thoroughly cleaned, and the clean surface attacked
nitrate of silver. (See p. 347.)

Acid lithatic urine may be rendered less irritati
attention to hygiene and diet, and by the administrat
alkalies and bitters. (See Indigestion.) Sounding ma
cover a vesical stone. (Consult Surgical Works.) Cu
enough enuresis has been cured by *sounding* even wh
stone has existed. *Dilatation* of the urethra in gir
also been employed successfully as a *dernier ressort*
treatment of enuresis in them. (For Stone in the I
see p. 391.) The last cause of incontinence is the
difficult to remove, but hygienic measures—diet, ex
cold douches, and the like—are potent therapeutical ag

In a subject of so much importance it will be ne
to study the *treatment* and *pathology* more closely
great frequency of incontinence is an excellent illustra
the canon of infantile nervous pathology, that the
dominant and cerebral inhibition subsidiary. Control
lower centres and passions is less easy in children tha
healthy grown up. The child is much more a mac
reflex activities than the adult.

The micturition centre in the lumbar cord is mo

plicated in function and structure than the defæcation centre. There is action and inaction side by side. The detrusor urinæ is inactive, the sphincter is active when micturition is not in progress. The action and inaction change places when urination occurs. The cause of micturition is a reflex stimulus chiefly from the neck of the bladder. This stimulus or sensation is associated with a cerebral feeling—a desire to pass water. The micturition centre may be controlled by cerebral impulses passing from the brain to lumbar part of the cord. These cerebral impulses are probably necessary for the neat performance of ordinary micturition.

In enuresis the child is unable to control the centre when the feeling or desire to make water occurs. Or the centre may be so active and irritable that it explodes or discharges almost before the cerebrum is made aware of the state of the bladder. The neck of the bladder being the most sensitive region—trigger-area—for the firing off of the micturition centre, any irritation here should be lessened as far as possible. So it is advised to keep the *pelvis as high* as possible during sleep, when all reflex actions are excessive. Sleeping with the *head* and *shoulders low* by inclining the mattress, and with a view of keeping the urine at the fundus of the bladder, seems therefore a rational procedure. Again, sleeping on the back appears to be conducive to bed wetting, probably because the lumbar centre is more congested and irritable in this posture ; so that a bandage enclosing some hard body, like a pile of coin or reel of cotton, may be fastened round the hips, so that the hard body rests on the sacrum.

But our best means for combating enuresis is the employment of drugs, which *lessen* the *activity* of, or strengthen the *reflex mechanism*. Such agents may act chiefly on the sensory nerves, or chiefly on the centre, or chiefly on the motor nerve and muscles. The tonics, whether exercise, cold

douche, or strychnia, and the like, perhaps increase the tone of the sphincter vesicæ. But we do not yet know everything in this matter. Large doses of belladonna tincture (mx., t.d.s., to begin with for a child three years old), and pushed till the pupils are large and the throat dry, is certainly a useful remedy. But it may be necessary to push its administration up to the limits of safety, and to persist in its use for some days, and that even after the disappearance of the symptom. The discontinuance of the medicine should not be sudden and complete, but gradual—the amount being first reduced, and then the number of times the dose is given. It is useless to give belladonna without first dismissing any obvious exciting cause. It is also important to limit the evening drinks, and to make the child completely evacuate the bladder before going to bed. The habit of bed wetting may often be broken by waking the child every four hours, or less often, during the night, and insisting on complete micturition.

Liquor *strychniæ* in drop doses three times a day, or three minims of nux vomica, with Mist. Gent. Alk., has been very useful in my hands for children of five years of age. The alkaloid may be pushed up to three or five drops, the patient being carefully watched. I have seen this succeed in obstinate cases, especially in girls, above the commencement of the second period of dentition.

Again, *tincture of perchloride of iron* in large doses (mx. in 3ss. glyc., t.d.s., for a child of seven) is often valuable.

Other remedies that are sometimes successful when the above have failed are :—Liquid extract of ergot in ten-minim doses ; syrup of chloral hydrate ten minims ; bromide of sodium or ammonium, ten grains ; benzoic acid, especially when urine is alkaline, ten grains ; cantharides tincture in drop doses ; camphor, especially if there be priapism, in five-drop doses of the strong spirits ; infusion of digitalis in half-dram doses ; borax in ten-grain doses ; nitrate of potash in ten-grain doses ; turpentine, ten minims ; fluid extract of rhus

toxicodendron or aromatica, ten minims; tincture of lupuli, half-a-dram. All these doses may be used three times a day for a child of seven. They may be prescribed in ʒii. of water with the addition of twenty drops of glycerine. Turpentine should be suspended in mucilage or given in capsules.

I have often used the *constant current* (Coxeter's combination battery is convenient, as it gauges the strength of the current of electricity), of about the strength of two microamperès. The positive pole is placed over the sacrum, the negative is stroked about the hypogastrium, under the penis and perineum. It should be used once a day for ten minutes. Sometimes a smart shock from the faradic current proves effective. It cures a few cases when other means have failed. The faradic current of light intensity has been used in the same manner as the constant current.

A blister over the sacrum may be used in chronic cases, and the sore kept open with Ung. Sabinæ for a few weeks. The use of a strong caustic to the neck of the bladder, which should be done by a careful surgeon, has been recommended.

Lastly it should not be forgotten that the cases cure themselves not unfrequently at the age of seven and fourteen years, *i.e.*, about the beginning of second dentition and puberty.

I cannot advise the *frequent nocturnal closure* of the preputial orifice or of the external meatus by collodion or other mechanical means. Mechanical obstruction does not prevent the bladder from contracting, and Dr. F. H. Champneys has adduced some evidence and more arguments to show that incontinence, with its excessive vesical contractions, may lead to distension of the upper urinary passages.

RETENTION OF URINE

may be due to inflamed phimosis, atresia of meatus, impacted calculus in any part of urethra, rectal irritation from any source, constipation, worms. I have made a necropsy on a male infant

one year old in which soft calculi were found in the right renal pelvis, and in the bladder, and one large fusiform one blocked the urethra at its front part; the infant died in great agony; it had not been treated. The urethra may be ruptured or the bladder paralysed by blows on the perineum and hypogastrium respectively. Surgical works should be consulted.

Atony of the bladder may result from prolonged retention, and may be a cause of retention, as in pyæmia, typhoid, and other long-continued fevers. In peritonitis there often is retention.

HÆMATURIA.

The commonest causes of hæmaturia in the child are calculus and Bright's disease. Sarcoma of the kidney may not bleed into the renal passages at all. A little blood may come from cystitis and from a urethral polypus. Severe purpura is a cause in children. And the boys of Natal suffer from Bilharzia hæmatobia.

When the blood comes from the kidney, it is equally mixed with the urine as discharged from the urethra. If from the bladder, there is more blood at the end of micturition. From the urethra, blood may be expressed by the doctor apart from micturition. The **treatment** should be that of the disease it complicates. The bladder should be frequently sounded by a careful surgeon. In the endemic parasitic disease, the blood usually comes from the bladder. The characteristic ova are oval, with a spur at one end; they are $\frac{1}{150}$ inch in length. The lively ciliated embryo may be seen after the chitinous shell is ruptured. Various means have been recommended for the treatment of this form. Santonin gr. ii., liq. ext. male fern ♏xv., turpentine ʒss., may be given as for worms. Injections have been employed of iodide of potassium gr. xv. to ℥i.; or santonin dissolved in alcohol (saturated solution) half-a-dram or a dram; liq. extract of male fern ʒi. to ℥i. of thin barley water. These

remedies may set up slight cystitis, which soon subsides under the influence of bland fluids and infusion of buchu ʒi., with succus hyoscyami ɱxv. three or four times a day for boys about ten.

ALBUMINURIA AND AZOTURIA.

Functional albuminuria is very common in infancy and childhood. Any fever may cause albuminuria, with apparently greater facility in children. Chronic disease, with debility and without anæmia, may give rise to albuminuria in children without there being any decrease in the urea discharged. Hypoazoturia—diminished excretion of urea—is said to occur in infancy not unfrequently, and the illness may look like gastric catarrh, but there is also a remarkable inelasticity of the skin, such as is seen in choleraic diarrhœa.

Transient albuminuria may be due to admixture of blood, chyle, lymph, pus or semen from masturbation escaping with the urine.

ALBUMINURIA AND BRIGHT'S DISEASE.

There is so little that is special to Bright's disease in children that, but for its frequent occurrence after scarlet fever, it might almost have been left out of consideration did not this book aim at some completeness in regard to the therapeutics of childhood.

Doubtless a chill, especially in convalescence from scarlet fever, can cause nephritis. Spontaneous or autochthonous, Bright's disease must be admitted at present. Measles and inflammatory diarrhœas may be causes in infants.

Usually, the onset is well defined in scarlatina and after exposure to the causes of chill. But the symptoms vary remarkably; pyrexia and vomiting are most frequently present. There may be no fever at all. Diarrhœa may go with vomiting. Dry skin and dropsy of the face or eyelids are almost constant. The dropsy may be absent from beginning to end, or most

extensive and rapid, with hydrothorax, œdema of lungs, rapid death. Occasionally convulsions and drowsines coma are the first or early symptoms. The drowsiness occur without fever and without convulsions. Pleurisy, p carditis, peritonitis, pneumonia, or bronchitis may dev The urine may be bloody or smoky only; its quantity is al diminished; the reaction generally acid; specific gr high, 1030; blood casts and renal epithelium are characte of the first stage; hyaline and granular casts occur The urine may be highly albuminous and contain casts yet there may be no other symptoms whatever pointing to disease. **Chronic** Bright's disease may be of the gran large white, or lardaceous description. All these forms been seen even in young children. Probably, long past s fever is a not unfrequent cause of the first and perhaps second. The course and clinical signs are apt to be er Any symptom may occur. Sometimes headache; at dropsy; again anæmia; now vomiting, nausea, and in tion; or perhaps only constipation and a dry skin. The cal pictures are fully as various as in the adult. Hea vomiting, and optic neuritis, with retinitis, even in chi may mean Bright's, not brain disease. There may albuminuria. The urine is usually increased in quan the granular and diminished somewhat in the white k It may be absolutely normal, even chemically, with a ceous kidney.

Treatment of acute Bright's Disease.—Of the tance of hygiology in the treatment too much cannot b Protection of the child from cold is the first grand ob hygiene. Maintenance of the action of the skin, lung bowels no less important. These are *prophylactic* m also.

The bed must be kept to ensure complete rest, so th slight expenditure of material may give the emunct

little to do as possible. The bed-clothing must be sufficient, but not so great as to increase pyrexia should this be present. The room must be comfortable and warm (65° F.), and ventilated without the child being exposed to draughts.

Drinks of bland fluids, such as thin sweetened and lemon-flavoured barley water, should be administered freely and frequently. Thirst is not always indicated by symptoms or signs in the child. This free drinking raises blood pressure, promotes sweating, bowel action, and renal filtration. The *skin* and *bowels* must be got to act freely and continuously. The best method is to place the child between blankets and use the *hot air bath*. A large cradle covered with bed-clothes makes the air space about the child's body, and the air is heated by a spirit lamp guarded in a stove, with the flue placed at the outside of the bed.

Frequent dram doses of solution of acetate of ammonia freely diluted in barley-water or milk, to a child of seven, may be given and repeated so as to keep the skin wet. If these measures do not answer, an eighth of a grain of pilocarpine may be injected under the skin, or half-dram doses of infusion of jaborandi given as often as necessary. I do not recommend diuretics that act on the heart, because such—digitalis, caffeine, squills, &c.—tend to increase the amount of albumen discharged, and perhaps maintain renal disease. But free drinking and the use of alkalies as above directed are valuable diuretics. Other alkalies than the liq. am. acet. may be used alone or in combination. But I have been mostly satisfied with it alone.

The best *purge* is compound jalap powder given in large doses as may be necessary, say gr. xx. to start with. Alcohol in any form should be prohibited. The heart and circulation seldom indeed call for any stimulation; they are mostly already over-excited. The diet should be plain milk and barley water, or vegetable soup carefully strained. Meat,

eggs, and, to be perfectly consistent, animal broths — as containing much extractives chemically allied to urea — should be interdicted.

Inflammatory chest or belly complications should be treated by hot moist local applications—fomentations under oil silk or poultices; mustard leaves or plaisters for relieving pain may be kept on ten minutes. Liniments of chloroform are useful also. Stimulants may be necessary. Tepid sponging may reduce fever, or a tepid wet packing with blankets over the wet linen may reduce fever, relieve discomfort, and improve the renal position. It is best to *avoid* mercury, cantharides, blisters, turpentine, internally or externally, and opium in all kidney diseases in children.

When improvement sets in the greatest care must be taken to avoid checking the functions of the skin, kidneys, or bowels. The medical sweating, purging, and diuresis may be discontinued. But if the child be allowed to get up from bed—which, indeed, is not to be done any sooner than can be helped; a wise child will easily remain in bed if he be old enough to have matters explained—his whole surface, except the features, should be uniformly protected with woollen clothing of sufficient thickness to prevent any risk of chill. He should remain in the house and in the same room, kept at a uniform temperature. Gradually if the albuminuria be surely subsiding he may go about the house—desquamation should of course be completed first—but this must be warm and free from draughts by assiduous attention to the doors and windows. All these considerations apply naturally with most force during seasons of doubtful weather.

For promoting the return to health, and for dispersing the last of the albuminuria, nothing medicinally can equal some preparation of iron. But it should not be prescribed straight away in large doses. The tincture of the perchloride is the best as being most tonic, but the bowels must be kept acting

at least once a day or the iron will do no good. The tincture may be given in five-drop doses with twenty of glycerine and a tablespoonful of water three times a day, say for a child seven years old. Dram doses of steel wine or two-grain doses of ferrum redactum or some saccharated carbonate of iron may suit better.

Dropsy may certainly occur in scarlatina, and be very marked and extensive without any albuminuria. It should be treated by absolute rest, perfect warmth of surface, tonics and diuretics as above indicated.

As *convalescence* continues the diet should be gradually improved, but the amount of meat and eggs should always be limited. Most children eat more than is absolutely necessary. The food must be digestible in kind, and to make it palatable is also desirable. The food should be fresh, not stale, preserved, tinned or salty. White fish, mashed potato and cauliflower, well-done spinach and Brussels sprouts, are suitable articles, with bread and butter, cocoa and milk. A little wine may be necessary, say ʒi. with dinner.

The persistent and early use of quinine during scarlatina is said to obviate nephritis by preventing the growth of the protoplasm of Bowman's capsule. But this is problematical. Hypodermic injections of ergotin (gr. iii., for a child aged seven years), gallic acid gr. x., local leeching—three to five—have been used to abate acute nephritis at its outset. They are of doubtful utility.

The **treatment** of **chronic Bright's** disease—lardaceous is not considered here—requires the same care and attention to *prophylaxis* and general *hygiology*. The *diet* requires restriction in respect of the proteids ingested, on the principle of not giving the emunctories, and especially the kidneys, more urea to excrete than can possibly be managed by them. Uræmia is the great danger, and probably this toxæmia is responsible not only for the brain symptoms, but for the

anæmia, dropsy, and the like. Skimmed milk is an excell drink and food for chronic renal disease. Increased sec tion of urine and remarkable benefit often follow the use this simplest of all foods. The patient requires the sa woollen clothing as in convalescence from acute nephr and the same care in the avoidance of the causes of cl The *skin* is kept acting by these means, and by bathing exercise. *Massage* may also be useful; but it should no vigorously done, lest the excess of waste products prove much for the kidneys. The exercise should be in the o air, and therefore a fine warm climate, with plenty of sunsl and few sudden variations in weather, is highly necessar

The *bowels* must be unloaded diurnally, and the habi going after breakfast should never be broken. Saline pu such as Hunyadi Janos, Eno's fruit salts, sulphate of soda, magnesia are the best. If there be indigestion, the princ recommended under that section may be carried out. A (℥i) wine and water for a child of seven may be given the meals if there be debility or poor digestion. Iron i most important medicine, and the tincture of the perchl the most valuable preparation.

As for agencies to diminish the amount of albumen, sceptical of their action altogether. But the most val are the alkalies, and the Mist. Gent. Alk. is a good mixt

Dropsy should be treated by purging and sweating b air baths, liquor ammoniæ acetatis ʒss. with tinct. acetatis ♏x., and purges of Pulv. Jalapæ Co. ʒss., or elate gr. $\frac{1}{16}$ in sugar of milk gr. iii. repeated as often as nece to ensure several watery stools. Some caution is nece with elaterium.

The amount of *liquid* imbibed should not be restr Diuretics that raise blood pressure and act as heart tonic membering the tendency to cardiac hypertrophy and incr blood pressure, are to be avoided, as I am sure they inc

the amount of albumen discharged. If we are to believe in experiments, the more albuminuria and the longer it is continued, then the greater and more lasting will be the renal lesion. Saline diuretics are the best. Nothing can be better than acetate of potash gr. x. mixed with acetate of iron ♏x., and solution of acetate of ammonia ʒss. freely diluted for a child ten years old.

Rarely renal dropsy may require *drainage* from the ankles or belly by incisions or Southey's tubes. Every instrument and article that are used should be clean and aseptic. Erythema and erysipelas are prone to occur, and the parts should be kept warm by hot boracic acid fomentations protected with oil silk and clean domette bandages.

LITHIASIS AND RENAL CALCULUS.

Children overfed or rickety, or of rheumatic and gouty stock, frequently pass uric acid. Urine containing blood equally diffused through it is the commonest symptom of renal calculus. Absence of renal colic is quite remarkable in children with undoubted stone in the renal pelvis. There may be no symptoms or signs of renal calculus. *Pyuria* may be the only sign. Besides bowel complaint, spinal disease and kidney trouble cause *umbilical pain*. Sometimes there are hæmaturia, frequent dysuria and pain on movement without renal colic. These symptoms may point to calculus in the bladder, though the stone is not there, but in the kidney. At times the kidney may be felt unduly on deep pressure in the loin.

I have said that the digestive and assimilative apparatus are the most important organs in the child. They are also very sensitive organs. It is not so much the kidney that is at fault, but the liver and stomach and intestines. Metabolism is altered. According to some, as laid stress on by Fothergill, there is hepatic reversion. The liver returns to

the reptilian and avian type, makes more uric acid, or immediate antecedent, and less urea. Any influence in child may effect this change. Over-feeding, especially v indigestion, of proteids, sugars, and starches, are po causes of "hepatic reversion." The brain and cord r affect the liver, or whatever it is that causes lithi when their nutrition is baulked, as from over-study mental shocks or emotional excessive expenditure of ene or sometimes from inherent innutrition of the nervous syst Want of fresh air and the causes of chills, perhaps acting the stomach and intestines as well as on other organs, are agents in the causation of lithuria or lithiasis. Again metabolism is excessive in infancy and childhood. M urea is made per kilo of body weight, perhaps 2 gramme every 3 kilogrammes of body weight; the adult proporti 1 gramme of urea for every 3 kilogrammes of body we Uric acid is often deposited in kidney tubules and all a the urinary tract.

There may be no symptoms at all, but sometimes the passage of gravel or sand (uric acid), in not large quant may cause pain of renal character, even fainting and v ing, dysuria, hæmaturia, and pyuria. And yet there be no concretion, for free drinking of salutaris or dis water may remove all symptoms. I have watched for years a case of this kind in a boy aged $5\frac{1}{2}$-$7\frac{1}{2}$. If he l off his quart a day of water, he passes much sand, and the urine is smoky, occasionally bloody, with other symp Whilst taking his full drink the water is free from albu He has been repeatedly sounded for stone, without r He is at present improving on a tonic of sulphate of and tincture of nux vomica.

Pyonephrosis and hydronephrosis may result from calculus in childhood. Abscesses may also be perinepl situation.

Treatment.—*Hygiology* rules the situation. Generally speaking, kidney stone is diagnosed too often. Frequently there is only gravel or sand; not concretion. Regulation of regimen should be rigidly righted. Not only too much meat and eggs, but too much sugar and starch are to be forbidden. Chapter II will serve as a guide. Indigestion is to be treated, see p. 35. Jellies and gelatinous substances should be avoided both in gout and rheumatism.

The skin is kept secreting by warm woollen clothing *cap-à-pied* and by exercise, or massage for infants. Cold and damp may be avoided by the same means, and by careful attention to the bedroom and play-room or nursery. Attention must be given to the hygiology of the nervous system (see p. 398). Drink is most important. Two pints a day for a child of seven is not too much. Distilled water, aërated, or salutaris are the best. Thin, sweetened and flavoured barley water is also good. The flavouring may be done with any of the cook's essences, but the quantity used should be the least possible—of vanilla, lemon, aniseed, &c. Saccharine well deserves a trial, for food and drink may be rendered sweet without entailing the use of more than a few drops of it. Animal broths should be avoided. Rhubarb as yielding oxalates should be prohibited. If such measures do not clear the urine of blood and sand, alkalies should be prescribed. Bicarbonate of potash or the citrate may be given in ten-grain doses three times a day for a boy of seven. The urine, to be lithontriptic, should be kept neutral or alkaline. This is the indication for the amount of alkali required. Stimulants should, as a rule, not be ordered. If the child be feeble, however, a little sound claret or high-class wine may do good. A wineglassful to dinner may be given to a boy of seven. The dinner should be at midday.

Nephritic colic requires the use of hot baths, temp. 98° F.; hot fomentations to the loins, and free potations of warm

bland fluids like thin flavoured barley water. Opium may given if these measures do not relieve pain. Five drop laudanum may be given, if there be no evidence of re disease, to a boy of five, and then drop doses every quarte an hour till relief is obtained. Of course care is required to narcotise the child. Massage over the suspected kidney downwards along the ureter may do good. Belladonna t ture may be given in five-drop doses with or without the opi If the pain is unbearable and uncontrollable inhalation of chl form may be legitimately used and tends to relax spasm.

The persistence of symptoms is an indication for r sounding either by punctures with a fine needle or cutting the loin by a careful and antiseptic surgeon. Nephrot should be performed if a stone be detected. Cleanliness asepsis should be carried out as rigorously as poss (Consult surgical works.)

Tonics of iron and nux vomica sometimes remove habit of passing gravel and sand in debilitated atonic, th not necessarily anæmic boys.

KIDNEY TUMOURS.

Congenital hydronephrosis and sarcoma are the kidney tumours. The tumour is the chief indic Hæmaturia is a sign of sarcoma, but I have seen four ca renal sarcoma without hæmaturia from beginning to en

The tumour may be suprarenal or extrarenal whe physical signs are the same. In one suprarenal th examined after death the external genitals were over-deve and covered with long large hairs in a female aged years. Dr. Dickinson has recorded a similar case i "Pathological Transactions." The tumour occupies the the dulness goes right back to the spinal muscles; it not move with respiration; the colon is in front of palpitation or percussion may reveal. The liver is ofte

located forwards and downwards, and may be flattened. Pressure signs occur later on—large superficial veins, œdema, and dyspnœa are the chief. Secondary deposits nearly always occur in the glands of belly and mediastinum, in liver and lungs.

The sarcoma may fluctuate from softness of the round-celled growth into which blood is often extravasated. The exploring syringe may draw off blood and cells if the growth be a sarcoma; if hydronephrosis, clear fluid containing urea may be withdrawn. Pyonephrosis may occur, and may be, not always, indicated by pyuria and by chills with fever.

Renal sarcoma is most frequent during the first few years of life. All the six cases I have seen were under four years of age.

Wasting and anæmia are the chief symptoms of sarcoma; pain is not frequent; hæmaturia may occur. Most cases die before a year has elapsed after the detection of the tumour. Hydronephrosis may last longer. Double hydronephrosis usually causes still-birth. In an interesting case I saw one kidney was cystic, like a small bunch of grapes; the other kidney was hard and fibrous, but functional; there was remarkable lipæmia; the blood looked on the post-mortem table like milk, or as if it had been mixed with carbolic acid. No tumour was felt during life. The infant was ten months old. It is important to remember that renal tumours of congenital origin are frequently accompanied by other congenital abnormalities. In six hundred post-mortem examinations I have found one kidney absent thrice.

The diagnosis of kidney tumour, as distinguished from enlargement of the liver and spleen, or ovarian tumour, psoas abscess, or mesenteric swellings, is usually easy. I have not seen a case of primary malignant disease of the liver in a child.

There is but little to be done in renal sarcoma except to support the strength and relieve the symptoms. It is useless

to remove the tumour. When the kidney swelling is dete
secondary growths are almost inevitable. The shock o
operation is ill-borne. The treatment of hydronephrosi
pyonephrosis should be left to the surgeons. Free dra
and antisepsis would perhaps in both cases be better
aspiration.

CHAPTER XV.

DISEASES OF THE NERVOUS SYSTEM.

HEADACHE.

As in the adult, the number of causes of headache is legion. Megrim, hypermetropia, and other errors of refraction are common causes of headache in children. Any blood condition may induce it. Anæmia, toxæmia from kidney or liver defects, indigestion, constipation, rheumatism, typhoid fever, and other acute specifics are also common causes. Meningitis and cerebral tumours are not likely to be forgotten.

The diagnosis will rest on the associations of the headache. Errors of refraction are readily discovered by the ophthalmoscope; the headache is generally frontal and often supra-orbital. I have observed that headaches are more prone to occur in hypermetropics, myopics, and astigmatics even when there are other causes adequate to account for the headache—typhoid fever, indigestion, anæmia, over-work, or debility of any kind. This fact may be placed side by side with the observation of Dr. Gowers that optic neuritis from head disease (? other causes of neuritis also) is more prone to occur in eyes which are not emmetropic.

Megrim is irregularly or sometimes regularly periodic in its occurrence, like epilepsy and other neuroses. It is frequently hereditary on the maternal side. Other neuropathic conditions may coexist in the family. Fitful or recurrent vomiting is probably often of "megrimous" import or relationship.

The first step in the **treatment** of headache is to find out and remove or avoid the cause. In most cases a combina-

tion of causes coexists. Is it not strange that the head
of cerebral tumour should be so variable even when
tumour is growing? See some remarks (p. 404) on th
moval of symptoms by castor oil—symptoms which were
doubtedly associated with organic lesions. Sometimes
headache may be due to other causes in connection wit
chief cause, but the chief cause may be insufficient at
to develop headache. The same considerations hold go
other intermittent symptoms.

Attention to the hygiene of the whole body indirectl
proves the health of the nervous system. But the hygi
of the nervous system should be taken into special ac
—the removal of all irritations to the peripheral nerves
skin, mucous membranes, teeth, nose, pharynx, &c.; th
vention of over-action of any part of the nervous sy
especially of the cerebral cortex (over-study, emotional e
ment, excessive noise, light, sunlight and heat, bad smel
tastes); the promotion of *perfect* action in every part
nervous system, and especially of the cortex and w
apparatus, by regulated habits of work, exercise, play an
It need hardly be said that any cause, intrinsic or ext
that interferes in any way with the formation and ox
tion and depuration of blood must also be removed, a
or overcome by whatever means may seem most adeq
the particular occasion. A large broad-brimmed str
is advisable if such children have to go out into ex
sunlight and heat. A woollen cap may be used
winter or cold weather, to keep the head at a comf
and uniform temperature, and so to ward off headach

Massage of the whole body is a very valuable agent
promotion of the general health, and it appears also
a sedative action on the whole nervous system when
in a state of irritability which is always associate
debility. Active manifestations are not signs of stre

a rule. Voluminous discharges of energy are rarely the results of careful consideration.

Massage may be regarded as replacing exercise. Everyone knows the sensation of satisfaction that attends muscular motion when the body is healthy. A similar sensation is experienced after a massage neatly and completely done. The movements practised in total massage of the whole body are practically those described under Infantile Palsy (q.v.), but it is not possible to carry them all out efficiently on the trunk. The grand aim should be to squeeze and knead the muscle without injury to the cutaneous nerves. With a little practice, most intelligent people may be taught the necessary manipulations. Cold douches should be ordered also in severe cases of recurring headache of nervous origin.

Certain drugs are valuable. Arsenic, in small doses after meals for a few weeks, is certainly of considerable value as a nerve alterative and tonic. Steel wine may be given with it if there be anæmia.

Bromides of potassium, sodium, or ammonium are most useful during the attack, but may be prescribed also in the intervals, in combination with stomachics, or alone, with a view of breaking the nervous habit.

Guarana may be given during the attack, ten grains of the powder in syrup of lemon ʒi. and chloroform water ℥ss. for a child ten years old. The fluid extract is recommended, and it may be administered in syrup of orange ʒi. and water ʒiii. in a fifteen-minim dose to a child of the same age.

Children in the attack of megrim are miserable, and feel chilly, and every movement usually increases their distress. Therefore they should be kept abed with the blinds down—warmth, storage of force and recumbent posture are implied—if the headache threatens in the morning at the time for rising. I think it is good to give a strong cup of tea or coffee just to cut short or ward off a threatened attack. It will be

remembered that caffeine is the alkaloid in guarana, and that the alkaloids of tea and coffee are practically the same. I think also a saline purge is valuable, such as a solution of magnesic carbonate, or Friedrichshall, with plenty of warm water to promote peristalsis, and perspiration, and circulation.

Sour-smelling breath should be a sign for emesis, even if emesis have occurred as part of the megrim. Warm water, with a little mustard, is best. I say a little mustard, because with some of these children half-a-teaspoonful in a cupful of water will be quite enough, whereas others may require two or three teaspoonfuls. In pure neurosal headache, the pain may be sometimes prevented by local applications of hot or cold water, by means of Leiter's tubes or Thornton's ice-cap. I do not think this leads to increased frequency of attacks, and in one case I was of opinion that it led, with other measures, to their ultimate disappearance in a boy 12 years of age. Cold water, through Leiter's tubes was used over the front part of the head. The ophthalmic surgeon and the surgeon dentist sometimes relieve recurring headaches by correcting errors of refraction on the one hand, or by removing carious teeth and attending to those coming onwards on the other.

NEUROTIC CHILDREN.

A child may be nervous without having any definite nerve affection. There is a sort of nervous common ground from which any nervous affection may start.

The phenomena or marks of this nervousness are restlessness, twitching of small muscles, as of face and hands, sudden depression, sudden excitement and explosive modes of working or doing anything. The child is easily made to laugh or to cry. The transition of mental states is too abrupt—judged by the normal standard. The child may be too clever, and is often dramatic; unnaturally bright at one

moment, and preternaturally dull at another; and profoundly influenced by changes in its physical or mental environments. There is great diagnostic value in the twitching of the fingers and face, and in the constant restlessness.

This nervousness may be inherited from one or both parents, or it may be acquired. It may be acquired from physical defects of hygiology or from less material causes. Thus defective digestion, from bad feeding or bad clothing, or inattention to the bowels and skin, may develop nervousness, or it may be "school-made" from over-study and competition. It may have developed suddenly from fright or terror. Scarlet fever often develops it; typhoid fever may abolish it; rheumatism may cause it to be inherited, or may even make it.

Children with a functional nerve disease are usually, but not always, nervous. An organic lesion of the brain, whether stationary or transient, is usually attended with nervousness. Hysteria and organic brain or cord disease may go together.

The etiology gives the cue to **treatment.** Great is the ease with which these cases may leave the common ground and move off into special spheres. Prevention is therefore better than cure. Armed neutrality, with strong defence at every weak point, is the method. They may go wrong from over-study. The over-study may tell, curiously enough, not on the brain but on the bowel, or even over-study may develop enuresis. The diet, clothing, exercise, education, play, work, everything in the environment, internal or extrinsic, exact all attention. Strange is it that a piece of work that one time will completely upset the nervous system may at another leave it untouched. Seldom does this remarkable resistance happen, but it is an encouragement; it proves that the nervous energy can be got to the "sticking" point.

Besides prophylaxis and hygiene, other treatment of tonic, specific, and sedative description may be needed.

Iron and arsenic are invaluable tonics. The iron may be given as the ammonio-citrate with spirit—the vinum ferri or any of the well-known syrups may be given. Some object to the syrups as provocative of acetous or lactic fermentations. In the usually prescribed doses I have not noticed this inconvenience. Cod-liver oil is often needed and frequently well borne.

Stimulants with meals do good; stout, claret, wine or beer may all be useful in different cases. Maltine frequently causes biliousness if given in too large doses. Pepsin in five-grain doses to a child of five may improve gastric digestion.

Sedatives are the bromides and chloral three times a day, or better in a single nocturnal dose. They may be combined often with advantage. Five grains of chloral and five of bromide in syrup ʒi., Aq. ʒss., may procure a good night's sleep, free from restlessness, in a child, say, three years old.

Hydrobromic acid ♏x., syrup ♏x., Aq. ʒi., is preferred by some.

Great is the necessity for regulation and daily evacuation of the bowels. Any simple purge will do. Liquor magnesiæ carbonatis ʒss., syrup of senna ʒi., cascara sagrada ♏xv. in a capsule t.d.s., or effervescing citrate of magnesia.

PULSE AND RESPIRATION.

I consider these subjects here because of their important relation to the nervous system. The pulse and respiration in infancy, like the other nervous actions of infants, are remarkably frequent, irregular, and easily disturbed or irritable.

The number of heart beats at birth is about 150, but their number is liable to great fluctuations. The number per minute is generally above 100 during the first year, and about 100 during the second and third years. Ninety is a common number after the third year, eighty after the fifth, and seventy after the tenth. But these are by no means constant.

Sleep nearly always lessens the frequency; if possible the pulse should always be counted whilst the child is asleep. Any, even minute, disturbance may throw both the rhythm of the pulse and that of breathing out of its usual condition. (See also p. 141.)

Croaking respiration is mentioned here because I believe it partly depends on a spasmodic neuro-muscular element. I have already referred to the shape of the epiglottis in infancy (p. 136). The croaking is usually inspiratory, but occasionally expiratory also. It is deeper toned than the sound of "crowing" inspiration. It is most common in female infants; is congenital for the most part, and always present; but less marked during sleep, and after the administration of chloroform as a rule. It usually remains with the child for many months, and may do so for two or three years. As a rule the children grow out of it in time. It is not generally attended with signs of obstruction to the entrance of air. And though the infants are usually debilitated, it does not seem to shorten existence or to be in any noticeable degree injurious to their health. Indigestion, catarrhs and other slight ailments may increase its intensity, and perhaps prolong its existence. Dr. Gee has described many cases in the Bartholomew's Hospital Reports, and Dr. Lees regards the condition as sometimes at least dependent on an increase in the normal incurvation of the epiglottis ("Path. Trans.," Vol. xxxiv.).

The **treatment** should be hygienic and dietetic, with regulation of the functions of the bowels and skin as described in Chapters II. and III. The clothing of the infant should be carried out on the lines already laid down. It is very important to correct anything wrong with the atmosphere, bowels and digestion. Tonics of cod-liver oil and iron may be prescribed in minute doses.

But treatment does not, as a rule, influence the condition very much, though, as I have mentioned, transient dis-

turbances either in the health or surroundings of the i
makes the croaking more marked.

Large mammæ secreting a milky fluid in new-born in
may occur in either sex, and I cannot help thinking
presence should be ascribed to perverted trophic nervou
fluences. The tension and swelling of the glands somet
threatens to terminate in actual inflammation. Both b
are usually affected, but one more than the other. Th
attained is rarely greater than half a small Tangerine or

The **treatment** consists in preventing local irritation
in soothing the nervous system by strict attention t
hygiene, diet and bowels by the ordinary means else
described. The milk may be drawn off by the breast
if necessary, but warm moist fomentations and painting
glycerine and belladonna usually rapidly abate any irri
and swelling.

DISORDERS ASSOCIATED WITH TEETHING.

An infant more than a child is susceptible to any sti
or change, either in its internal or external enviro
And owing to the want of development of the nervous s
a disturbance arising at any part of it is propagated
whole tracts of nervous tissue in an indiscriminate fa
the result probably of want of that inhibition that the c
cortex eventually comes to exercise over the whole
lower centres. We must admit that morbid process
occur at the site of the dental follicles and lead refl
disturbances at other parts of the nervous system. W
confess also that cases of derangement or disea
attributed to disorder of the dentition, when it is cle
the gums and teeth are sound, and that the diet, clot
some other part of the surroundings of the infant is a
Lastly, it is necessary to say that normal dentition
produce symptoms of disease. But owing to imperf

in feeding, and to other hygienic defects, an active process like that of dentition is prone to step beyond its normal limits with corresponding disturbances in the system. It need not be that abnormal processes in the dental follicles should reveal themselves by local changes in the gums.

The practitioner will find enough occupation in steering clear of various derangements and their consequences that accompany dentition, but the use of the lancet in these cases should be restricted to a very small sphere. If there be obvious tension and swelling and redness at one part, the scarification and local depletion with the lancet will serve, at least partially, to relieve reflex irritation and local morbid sensation. Even a blue gum evidently swollen, and often fluctuating as in some congenital syphilitics, may produce no symptoms; the lancet put into this sac may turn out a necrosed enamel crown.

Simple stomatitis, *ulcerative stomatitis*, *diarrhœa*, *bronchitis*, *vomiting*, *otitis*, *squinting*, *convulsions*, *laryngismus stridulus*, *erythemata*, and *eczema*, and attacks of *fever* of *irregular type*, are the commonest maladies associated with or attributed to dentition. Infantile paralysis, probably, has nothing whatever to do with dentition. A combination of fever with squinting or convulsions may suggest *brain disease*, or of erythemata with fever an acute specific fever, but he would be a poor hand at diagnosis who would not first think of functional disorder as sufficient to produce both combinations. It does not always follow that the disappearance of pyrexia and of squinting after the administration of a dose of castor oil *proves* that constipation (which is rare from teething), fever, and squinting were simply functional. I have seen at least one case, in an infant 15 months old, in whom there was this combination of symptoms, relieved by castor oil, but in which the subsequent history showed that meningeal disturbance may have had at least some share in the causation

of the symptoms. The child died of tubercular menin ten days from the first appearance of symptoms; constipation, fever, and squinting certainly passed away 24 hours after a teaspoonful of castor oil. A gray po gr. iii., or castor oil ʒss. to ʒi., or rhubarb and soda gr. x., will generally remove fever associated with denti The second remedy will also effect considerable impr ment in dentition diarrhœa, though attention must be dir to the diet; the stools are not greatly changed from normal in the pure dentition diarrhœa; they are not offe and contain, as a rule, no obvious slime; the curd is digested. The infant whilst teething must be protected chill either of the chest or the belly, and this is requisit more in summer and autumn than in winter and sprin the reason that in the latter periods parents are partic careful about the avoidance of cold and damp. The and belly should, therefore, be uniformly protected, an clothing changed in accordance with the state of the we which is liable to remarkable diurnal and nocturnal tions, in the autumn especially. Vigier has in diso dentition rubbed the gums several times daily with a sy cocaine—two grains of the hydrochlorate with ten dr tincture of saffron, and three drams of syrup. It shou be allowed to be swallowed. For the further treatm the maladies attributed to dentition, consult the v articles.

The **period of second dentition** is one that is liabl attended with *nervous* and *digestive* troubles, but in al of the kind there will be found, on careful inquir examination, to be other causes at work, either in the f excessive study, a nervous defect of constitution, over- insufficient exercise and fresh air, inattention to the and the like. Simple attention to the hygiene of chi will remove most simple troubles that seem in any wa

related to the development and appearance of the permanent set of teeth.

"Night terrors" are a species of reflex cortical epilepsy in my view, and they may be readily controlled and caused to disappear in the vast majority of cases by systematic attention to hygiene, and by the administration for a week or two of some simple mixture like this :—

℞ Pulv. Rhei, gr. iii.
Pulv. Sodæ Bicarb., gr. vi.
Magn. Sulph., gr. vi.
Syr. Zingib., ℥xx.
Aq. Menth. Pip., ʒiii. t.d.s.

for a child seven years old.

I sometimes add Am. Brom. gr. ii. or Chloral gr. ii. if the child seem nervous and excitable during waking hours. The most important hygienic item is the diet, which should be restricted all round, but especially in the matter of pastry, puddings, pies, potatoes, pork, and sugary or starchy food generally. I interdict also the use of tea and coffee except in the form of a "make believe." Cheese and beer of course are forbidden, together with any cakes or preserved fruit. If the child had fits during the first dentition, or if it has suffered from other neurotic manifestations, or there be a neuropathic heredity, then, doubtless, the "night terror" is more largely due to the central nerve irritability than to the peripheral, digestive, or other disturbance.

Rheumatic children are often of neuropathic tendency. They are frequently the subject of night terrors or nightmares at the climacteric periods. They are also liable to lientery (see p. 54). Treatment of their complaints may take place in one of two or in both directions. Sedatives to lessen the irritability and anti-rheumatics to act directly against the cause of the irritability. Bromides, chloral, and opium on the one hand; salicylates of soda, lithia, quinine on the other.

"Dentition cough."—During both periods of dentition t may be a cough which appears to be almost entirel neurotic origin, *i.e.*, due to over-activity of the respira centres, the exciting causes being so slight that they hardly be more than the usual stimuli constantly actin the centripetal terminations of the respiratory centres. should not be forgotten that a mere temporary chang quality or quantity of blood circulating in the respira centres may be the actual exciting cause of cough.

"Puberty cough."—About the period of puberty, espec in boys, there often persists for months a remarkably and barking cough; it is in some way related to the con tion attendant on the accession of adult life.

For either of these coughs a course of bromides i treatment, but the hygiene, diet, exercise, sleep and ba should be attended to.

Eruption of Teeth.—There should be twenty milk tee the jaws at the termination of the second year; the orde time of appearance is thus schematically represented:—

	1	2	4	3	5
	c.i.	l.i.	c.	m.	2nd m.
Months	7	9	18	12	24

The first teeth in the permanent set (of thirty-tw appear are the first molars at the age of seven yea before:—

	c.i.	l.i.	c.	bic. 1.2	mol. 1.2	wisdc
Years	8	9	12	10-11	7-14	adu

As a rule in both sets the lower ones come first. variation, especially in the first set, is often very great. R notoriously delays the appearance of the teeth.

RAYNAUD'S DISEASE.—SYMMETRICAL GANGRENE EXTREMITIES.—LOCAL ASPHYXIA.

This disease is most likely due to spasm of arterioles bably excited through the agency of the spinal vasc

centres. I cannot accept the peripheral neuritis pathology of the disease. Like paroxysmal hæmatinuria, with which it may be associated in the same child, and in the same attack, it is distinctly related to cold, which can frequently, when artificially applied, induce an attack of the disease. Intermittent hæmatinuria might be regarded as asphyxia of the kidneys, resulting from spasm of renal arterioles. There is usually little or no fever. The affection is frequently symmetrical in both feet, both hands, or both ears. Sometimes the tip of the nose is the seat of the "asphyxia," or it may occur in disseminated areas in the skin. The affected parts suddenly or rapidly become intensely purple violet in colour, and may as rapidly clear away without gangrene following.

The amount of the gangrene when it occurs is very variable. Pain is always very great even without gangrene. There is usually tenderness also of the parts involved. The duration of the attack varies, but is usually at least some hours.

The urine may be porter-coloured once only from the hæmatinuria. The *diagnosis* is not difficult after the child has had one attack. At first embolism might be thought of and the heart should be examined. The **treatment** is to keep the parts warm and well protected during the winter months. Cold and damp should be avoided both outdoors and in the house. Sufficient exercise to keep up a glow wards off the attacks. *Friction* of the feet with cold water has seemed to shorten the attacks (T. Barlow). The descending galvanic current along the spine and to the affected extremities may be tried daily and continued all through the cold weather. The positive pole should be put to the back of the neck, and the negative used to stroke the skin below. In applying electricity to the extremities the positive pole may be put over the sacrum, and the negative moved about all over the legs. Care should be taken that the nervous energy is not too freely expended by emotional excitement

or over-education. The pain should be relieved if necessary by opium, or bromides, or chloral, as well as by the local treatment above given. The clothing is a most necessary consideration. The flannel binder besides should protect the belly in hæmatinuria.

Appetite and digestion need attention. Massage both of the parts most liable to be affected and of the whole body is certainly valuable.

Doubtless a condition resembling in some respects Raynaud's disease may complicate any organic nervous disease, *e.g.*, hydrocephalus, but that is very different indeed to the sudden fits or paroxysms of local asphyxia.

TETANY.

Tetany like laryingismus stridulus in young infants is mostly associated with rickets. The painful tonic contraction may affect one hand or one hand and foot on the same side, or commonly both hands and feet. The hand becomes cone-shaped—accoucheur's hand—the thumb is drawn across the palm, but extended, not flexed; the fingers are straight but semi-flexed on the metacarpus—"interosseal position"—because due to the action of the interossei.

The foot is over-arched and apparently shortened. The spasm does not vary much from moment to moment. There may be slight swelling and redness on the dorsum of the affected foot and hand; this has been called "rheumatic" by the Germans.

Sometimes the tonic spasm spreads up the limbs, and may affect, so it is said, all the muscles, and even those supplied by the motor part of the fifth nerve.

The facial muscles are always over-irritable. A tap or stroke with pen or finger causes contraction of the orbicularis of the mouth or eye, or of the zygomatic and nasal muscles. A tap on the nerve trunk is most effectual. Pressure on the

brachial artery may suspend spasm or induce it. The spasm continues under anæsthesia and during sleep. Facial irritability is not confined to this malady. Laryngismus and ordinary convulsions may be associated with tetany. **Treatment.** No known drug has any influence over tetany itself. Chloral gr. i., bromide of potassium gr. ii., calabar bean gr. $\frac{1}{30}$ increased to gr. $\frac{1}{2}$ may be tried three times a day. I have tried belladonna tincture in five-minim doses three times a day for a child twelve months old. The galvanic current is decidedly beneficial in some cases, and massage should also be tried. The positive pole is fixed at the back of the sacrum or neck, and the negative stroked up and down the affected limb. I always wrap the hands and feet up in cotton wool. But the treatment of tetany in infants is the treatment of indigestion and rickets (q.v.). The hygienic treatment is everything. The skin should be bathed regularly and kept clean. I am convinced that no drug has any influence on the spasm, which may last only an hour or two, but more often three or four days, and is prone to recur in the same child.

Tetany at puberty occurs in neurotic girls. It commonly affects only one hand. The pain is often great; spasm is frequently of short duration, but apt to recur. The hand or part affected should be kept warm. Specially lined gloves are good, or the hand may be enveloped in cotton wool and a bandage. The bowels are often confined. Facial irritability is rarer than in infants. Fright and emotions are causes. I think drugs have more influence. The best during the attack is bromide of ammonium in ten-grain doses three times a day. At the same time exercise in the open air, daily bathing or cold douches, regulation of regimen and bowels with a course of steel wine ʒii. and liquor arsenicalis ♏ii. t.d.s. should be ordered. Fresh food, as opposed to stale, salty, or preserved, should be ordered; and schooling should cease for a time. The spasm is probably dependent on discharge

from spinal centres, seeing that sleep and anæsthesia effect on it. However, its pathology is not certainly

CONVULSIONS.

Convulsions require much study, which they do because an acute observer is not often by at the time occurrence. Tonic, followed by clonic spasm, alway that the cortex of the brain is discharging. If the d causing convulsion occurs in gray matter, not cort sequence of clonic on tonic is not observed. All the convulsions in rickets that I have seen began as to finished up with clonic spasm. I have not seen cor apart from asphyxia in the new-born. In asphyxia neor I doubt whether the sequence obtains in regular ma think the clonic and tonic may be confused, and eit begin the "fit." The pyramidal tracts are undeve birth. Decidedly, experimental observations are value here. But we are in a transitional state on this I accept at once, and, indeed, have almost uncon held the views of Horsley, that there need be no difference between convulsions, epileptic fits, ec and epileptiform seizures. I have taught this for ye

The causes of convulsions are innumerable, if de to be given. Any disease of the nervous system, irritation, actual or potential, of its peripheral term may cause a fit. Rickets, acute specific, other fe chronic toxæmias may cause fits. Also gastric, visceral, and serous irritations. Tumours of the b meningitis may be specially mentioned. And irritat tense gums or inflamed middle-ear. Infancy predisp

In convulsions, the tonic spasm of the hand usuall flexion, the thumb being turned into the palm and by the fingers. It is difficult to say whether conscio lost or not in infants. If the conjunctiva is touched

spasm of the orbicularis prevents, it is assumed that there is loss of consciousness. An ordinary convulsion is essentially an epileptic fit, though there may be an organic cause. Local convulsions are highly important signs, but only if they be repeated, or if the convulsion spreads from limb to limb in a definite manner, say from face to arm, then to leg and trunk. The cortical motor centres, as discovered by Ferrier, Horsley, and Schäfer, are of transcendent importance. Face, tongue, and lips are represented in the lowest and outermost part of the motor cortex, arm next upwards, then leg, next trunk (marginal convolution).

Again, I accept without reserve Horsley's views as opposed to Broadbent's. They seem to me much more plausible and logical. Briefly put, Horsley's views come to this: The left hemisphere looks after the right side of the body. The unparalysed muscles in hemiplegia escape because the corticospinal mechanism is not damaged. Further, some movements are bilaterally represented. That is, the left hemisphere looks after chiefly the right-sided movements, but also the left-sided movements of some parts—on this point more information is wanted. The hand movements appear to be practically represented only in the opposite hemisphere, and destruction of the cortical mechanism means permanent volitional paralysis of the hand.

In convulsions it is the same. The left cortex discharges the right side of the body. Broadbent believes that the intimate association of spinal nuclei explains why it is that hemichorea is seldom strictly limited to one side. But Horsley's experiments show that left cortical discharges may fire off right cortical centres through the corpus callosum. In hemichorea, the trunk muscles are affected frequently on the opposite side. The trunk centres of opposite sides are nearer to one another in the cortex of the brain. Is this the explanation? Electrical stimulation of one lateral column

of the cord in monkeys does not cause spasm of both (Horsley) Why not, if the spinal centres are so cl connected?

The **treatment** of convulsions is to diagnose the c A warm bath at a temperature of 90° F., with cold spon of head, is all very well for the time. But hygiology is more important. Rickets must be treated (p. 90). Wo gums, and ears must be thought of. The lancet ma used if the gum be hyperæmic and tense. But it will often prevent the recurrence of convulsions. The ear be inspected with the speculum, under chloroform, if i suspected. A leech in the concha and hot fomentations relieve pain, but the tenotomy knife is the best treatm otitis be apparent. The single incision into the meml tympani readily heals. If there be escape of matter or s effusion, pain and perhaps convulsions cease at once. If be no effusion the bleeding caused by the incision affor effectual relief. In all convulsions and epilepsies the sto and bowels should be emptied. An emetic of sulpha of zinc gr. x. may be given by the nasal tube, and or more of compound jalap] powder may be likewis ministered if the patient cannot be got to swallow. enema of soap and water will empty the rectum and bring away thread worms.

The child should lie in the recumbent posture, and care taken by loosening the clothes to prevent obstructi the respiration. The mouth should be inspected, an throat kept clear. Plenty of fresh air without draughts s be supplied. The teeth should be prevented from bitir tongue by placing a piece of cork or the padded handl spoon between the jaws.

Sedatives may be required; chloral, gr. v., brom ammonium gr. v., may be given and repeated. The be injected into the rectum dissolved in warm

Two grains of chloral or six of bromide for a child twelve months old.

Exhaustion afterwards should be treated by brandy or liq. ammoniæ in ten-drop doses, repeated as may be necessary.

EPILEPSY AND MEGRIM.

What has been said on convulsions applies equally here. Epileptic children often have had convulsions during the first dentition. There is no essential difference between eclampsia and universal motor epilepsy. Epilepsy is characterized by recurrence of fits. Usually it has no organic cause. It depends on inherent instability of motor and sensory centres, or one or both. Motor symptoms are rarely present alone. Loss of consciousness is probably dependent first on the widespread character of the cortical discharge, secondly on its intensity. A voluminous and rapid discharge would cause instantaneous loss of consciousness. Sometimes the intelligence is only diminished. Megrim is epilepsy of sensory cortical centres. This is the view of Hughlings Jackson, and I adopt it.

Epilepsy is always, or is attended with, a cortical discharge. The discharge may commence in the pons and medulla. It does not signify whether the discharge is due to vasomotor spasm or to vasomotor dilatation. The discharge is the epilepsy. It is impossible to say whether the vascular state is primary or secondary.

A flash of light before the eyes—a coloured spot or a white-coloured spot—indicates a discharge in a spot in the visual centre. This is a very limited epilepsy. It may be due to toxæmia the result of "biliousness." But it is a nerve discharge all the same. The same arguments apply to sudden and total loss of sight which occurs in children who have at other times a full epilepsy with motor spasm of tonic-clonic sequence.

Ordinary **megrim** is not unfrequent in male children of neurotic type; the headache is not always severe, and is not usually hemicranial. Vomiting and a sense of misery are common symptoms. Teichopsia or coloured vision, fortification outlines, glimmerings and diffuse lighting up of momentary character, are due to discharges of varying intensity in the cortical visual centres.

Epilepsy or megrim, which you will, may be purely mental. Or these mental explosions may be complicated with sensory and motor disorders. A feeling of infinity or chaos, of enormous proportions or microscopic dimensions, a sense of hopeless calculation or task (Gee), lasting a short time and repeated at irregular or regular intervals, are perversions of normal brain currents, more or less explosive developments of energy in cortical perceptive centres.

Biting the tongue, passing urine and fæces are evidences of total epilepsy or convulsions. There is no function of the body that may not be perturbed, from complex mind operations down to simple acts of secretion. Thus fear and joy, spasm, salivation, palpitation, defæcation, micturition, priapism, &c., &c., may be due to explosive nerve discharges.

Speaking generally, megrim is a more continuous, less violent nerve discharge. Perversions of tactile sense and of muscular sense are not unfrequent. The limbs may feel as heavy as lead or as light as a feather. There may be incoordination of movement. And the child may not know in what position his limbs are when his eyes are shut (impaired muscular sense).

In the **treatment** of epilepsy nothing is more important than hygiology. Feeding, ventilation, clothing, bathing, exercise, regulation of digestion, of sleep, and of bowels all require attention. I believe with Hughlings Jackson that there is an epileptogenous zone at the periphery of the nervous system in most cases of epilepsy. When an aura

occurs perhaps it is the region to which this is referred that is the epileptogenous zone. The epigastric aura—a feeling of sickness or faintness or hunger—is common. In these cases the importance of attending to the food, digestion, and bowels is immense. Careful regulation of diet and a mixture of rhubarb and soda (see article on Indigestion), with daily exercise in the fresh air, will often cause the epilepsy to disappear for months together. The stopping of a fit, when the aura commences in the periphery of an extremity, by placing a tight bandage above the seat of the aura, or by simply grasping the limb, seems to me an argument in favour of the above views, as does also treatment by counter-irritation and setons. The treatment of an epileptic fit is the same as that for convulsions (p. 414).

In the intervals, if hygiene be insufficient to prevent their recurrence, medicines may be used. Tonics and sedatives are the chief agents. Cod-liver oil and steel wine are of great value (see p. 63). It is most important to procure proper sleep at regular hours. These children are some of those whose position in regard to the magnetic meridian makes the difference between sleep and insomnia. Cold feet must be prevented; they may keep the child awake. Hot and cold water applied alternately, and rapidly followed by friction and covering the feet up in cotton wool gloves, is generally effectual in severe cases.

The bromides are the best sedatives. They may be administered in different ways to suit different cases. Some cases are best controlled by giving, say, five or ten grains of the sodic or potassic salt three times a day in glycerine (mxx.) and water; or the bromide may be given in the stomach remedy —Mist. Gent. Alk. or Rhei c. Soda. Not unfrequently a half-dram dose of bromide of ammonium, given at night time, with twenty drops of glycerine and Spt. Ammon.

Aromat. in an ounce of water, does most good ; or a
dose may suffice. Sometimes the single dose
answers best when given in the early morning. I
occurs at night time the single dose nocturnally
valuable. The frequency of repeating the dose v
different cases. It is well to suspend the bromide fo
and to resume it later. The effect is often greate
method of administration.

Some caution is necessary with bromides, espe
young infants, in whom even minute doses ma
plaques of induration with sebaceous or suppurativ
material. In older children the acneform pustules
sult as in adults. These effects are not always prev
combining the bromide with liquor arsenicalis
arsenitis and belladonna. Sometimes the long
use of bromides leads to physical and mental debili

Liq. Arsenic ♏ii. may be given with steel wine
either alone or during the intervals of suspension of

As a rule stimulants should be avoided altogethe
nitrogenous animal food has been found by some to
epilepsy. Dr. Gowers does not confirm this. W
poultry, game, fresh vegetables, and milk are allo
meat and eggs should be given sparingly. An
vegetable diet is not to be recommended.

An important part of the *hygiology* of the nervous
prevention of injuries from falls and blows, especia
head. Tumours and epilepsy and chorea are often a
such causes. Again, fright and terror, however inc
prone to derange motor and sensory and perceptive
A fit of fright or terror is indeed to be regarded as
cortical epilepsy attended with violent discharge of e
accompanied by great derangement of intellect or
loss of consciousness. It is true that epileptics and
are often easily frightened or terrified; but th

resulting must be injurious all the same. Everywhere in the body, but especially in the nervous system, *habit* is observed. In childhood *habit*, which is unconscious or *second* nature, is easily established, but less easily broken, though *habits* may often be got rid of at climacteric periods—second dentition and puberty. The prevention of fits is seen to be necessary from such considerations concerning habit. But not for these reasons alone. Frequently repeated epilepsy is associated with imperfect mentation, leads to imperfect development of the brain, and sometimes to physical defects, such as excessive growth, undergrowth of skeleton, or to excess of flesh—polysarcia. How, is another matter. Perhaps they result from repeated congestions, but more likely from direct disorder of nutrition of brain and nerve. It is petit mal that impairs the intellect most. Petit mal is epilepsy of the intellect, not of the highest motor apparatus. Perhaps that is the reason for its malign influence on mentation.

Epilepsy not always congenital is often of organic causation. A large scar or atrophy of the brain (porencephaly) may be the cause.

The education of epileptics requires assiduous attention. Frequent fits should be a reason for stopping systematic schooling of the competitive character. The child should be taught control. He cannot control convulsions; but he may be taught to avoid excited gesticulation, too animated discussion, or too rapid speaking and thinking.

There are two ways of performing neuro-muscular acts, or in other words of discharging some and inhibiting other nervous centres. The performance may be done violently or quietly. Either method may effect the purpose in view effectively and perfectly well. But the former or emotional method necessitates the display or discharge of a voluminous amount of energy; the latter, equally effective, often undemonstrative, and certainly most artistic, uses up no more nerve force than

is absolutely necessary, and consequently is but exhausting.

As there are two ways of performing neuro-muscula so there are two types of temperament. The one tires from work, the other is but slowly exhausted effect of each act, mental or muscular, is precisely th in each, so far as the attainment of its real object cerned. Who can doubt as to the method to be inc the temperament (if possible) to be acquired?

The maintenance of health by every means at our is an hygienic consideration that is common to ne disease. There are few diseases which are predisp by perfect health. Typhoid fever is said to be o scarlet fever another. Diseases are, however, alwa easily dispersed when the body was previously heal mere lowering of vitality favours epilepsy in neurotic A defect in liver, a temporary inadequacy in kidne lungs, may increase and maintain epilepsy in children. The same considerations apply, indeed, a the nervous system. But I isolate their application force brought to bear at one point seems more p proves often more striking.

It is not a good thing for epileptic children "children's complaints"—measles, hooping cou the like. These diseases may secure permane epilepsy that might otherwise have disappeared. T do this in many ways, but chiefly two—by toxæmi cerebral extravasation. The latter cause need not sive. There are good grounds for believing that has been started in a small hæmorrhage (with sequ ring of brain), the outcome of a hooping paroxy blood diseases.

Whether masturbation is a cause of epilepsy is But there can be no doubt of its injurious effect, a

proneness to practise it on the part of children with defective brains. Circumcision should always be practised. It may be necessary to make the genitals so sore by blistering fluids that pain results from attempts to rub the parts. But all local causes of irritation should first be removed and weak mercurial ointments or glycerine of belladonna should be used to allay any local morbid sensation.

Simulated epilepsy may be met with. There is never true opisthotonos, and the conjunctival test is mostly absent; the tongue is not bitten, nor the clothes dirtied; stupor seldom succeeds to the paroxysm, which is made up chiefly of co-ordinated contortions of the countenance and limbs. Of course fixation of chest to the cyanotic point is not seen. Some cases are certainly co-ordinate convulsions of hystero-epileptic type. A smart shock of the faradic or constant current commonly cures the case.

Epilepsy may occur at night time without recognition. Wetting the bed is usually a nerve discharge limited to the spinal lumbar centre for micturition. Enuresis, however, may mean nocturnal epilepsy, and be the only obtainable evidence of it.

Cutaneous reflex epilepsy deserves one word. It is like the artificial epilepsy of guinea-pigs. The only case known to me is that of Hughlings Jackson. It was a boy aged seven, in whom a "fit" or "fall" with cessation of respiration and conjugate deviation of eyes and probable unconsciousness were induced whenever any part of the head was unexpectedly and lightly touched. In this case there was a permanent lesion somewhere in the motor apparatus of the brain, for there was persistent left hemiplegia with some want of development of the arm and leg.

Epilepsy may pervert the morals as well as the intellect of the child. His education should be directed to improve both and to prevent so far as possible their deterioration. His every

caprice should not be indulged. He should be taught, out undue harshness or severity, to recognize authority.

Many circumstances or conditions often improve ep for a time; and sometimes, indeed, the change, whate is, increases the frequency of fits. Change of occup of scene, of diet, sudden excitement of a joyous or depr kind, are such circumstances.

Want of occupation, idleness, is not good for epile Their minds should be interested and amused by me that do not strain the intellect or exhaust the energy. good for them; the fits occur less frequently thoroughly engaged in any pursuit, but perhaps this n because they only play or occupy themselves wher nervous system is at its best.

Gymnastic exercises are certainly useful in ep Perhaps the nutrition of the motor centres is thereb moted. Occupations that involve muscular moveme well as mental exercise should be enjoined—gar carpentering, tending to animals. Defective artic slouching gait, and awkward manners may be men the systematic use of the voice and articulatory ap and of other muscles as by singing and drilling.

Epileptics often learn to sing fairly, and the Solfeggi offers a valuable method of instruction as well as amu They often make fairly efficient performers in school The strict control and regulation of voluntary movem culcated by drill and singing must be of great val probably directly promotes the healthy nutrition of mo sensory nerve centres. The awkward movements may quite as much to defective muscular sense as to inco-ordination.

The child should be happy, for happiness induce action, and perhaps physiological hyperæmia, of centres. Such a state must promote a return to

Hence he should not be educated side by side with the healthy, for he will be led to feel his inequality, and this may make him miserable. He should be taught with others who are as nearly as possible of the same intellectual level with himself. The education, amusements, and diet of those classed together being the same, there is less room for jealousy, which is often a prominent emotion in epileptics and backward children. *Purging* systematically has been practised for epilepsy. This is really valueless. But the bowels should be regularly opened by simple aperients if there be constipation.

Some have advised the application of a leech to the head to ward off an impending attack. I should think it of no value.

Setons and blisters (counter-irritation acting by "inhibition") kept open for a long time are not much in fashion now, but in some cases they may be useful.

Tincture of *belladonna* alone has done good in some cases, but it acts best in combination with *bromides*. It may be thus freely pushed in cases that have resisted bromides. Some advise long continued small doses. It is of most value in cases of petit mal. Five minims of the tincture may be given with ten grains of bromide of potassium, t.d.s. The *nitrites* have been used in epilepsy, but are not of conspicuous value except in rare cases. Nitrite of Amyle may be inhaled in two-drop doses, or given in one-drop doses in syrup or mucilage, for a child of seven. Nitrite of sodium may be given in ten-grain doses three times a day. Nitroglycerine (trinitrine), in $\frac{1}{100}$ grain doses, either half a chocolate tablet or the one-per-cent. alcoholic solution. They may be used to cut short an attack or to prevent recurrence of fits.

Silver and zinc have also been used. Oxide of silver gr. $\frac{1}{2}$, nitrate of silver gr. $\frac{1}{6}$, zinc oxide gr. iii. (the most useful

of all), sulphate of zinc gr. i. They seldom succeed
the bromides fail. All these may be given three times
for children seven years old, and an hour or so after me

Musk and valerian are other remedies. They are
useful when hysteria is present; for the mode of admi
tion see Chorea.

Osmate of potassium in gr. $\frac{1}{100}$ doses has beer
ployed alone, and with bromides in children seven
old.

The treatment of megrim is given under "Headach

Dr. Gowers has employed borax with success in ch
The dose should not be large to commence with (gr. $\frac{1}{2}$
should not go beyond two grains t.d.s. It may
psoriasis when continued for months. Arsenic caus
psoriasis to disappear.

Digitalis may be used alone or in combination
bromides. For a discussion of its mode of action, and
for information concerning the action of remedies ge
in epilepsy, the reader should consult Dr. Gowers' wo
epilepsy. Digitalis is certainly useful in cases where
is a feeble circulation, and the heart palpitates o
slightest cause. The tincture may be given in tw
doses with bromide of potassium gr. x. for a child
years old, or it may be combined with the single no
doses. Its effect should be carefully watched.

INSANITY

Occurs in children. It may be associated with str
defects of brain, or be a pure neurosis.

There is melancholia that may lead to wilful star
emaciation and death. Attacks of mania may occur.
rent passions or fits of ill-temper without adequate
should be regarded as mental epilepsies that only dimin
do not destroy the intelligence. Children may become un

suspicious of the movements of people about them. They may imagine themselves the object of every whispering conversation.

The periods of second dentition and puberty are the times when mental disease is most prone to occur.

Stammering may occur at these periods. Dr. West says that stammering never occurs before the period of second dentition. I have not seen genuine stammering before that period.

Masturbation and insanity may go together, and each increases the other. For children the offspring of neurotic parents or alcoholic progenitors great care is necessary at all times to prevent their breakdown, but especially at the climacteric periods of dentition and puberty. They should not do the regulation amount of brain work. Good for them are plenty of fresh air and exercise in the open air, but not to the fatigue point. They should be treated as indicated under the head of "Neurotic Children." The asylum may be necessary.

At these epochs the speech may be lost altogether for a time, and have to be slowly regained. Speech may never come up to the average. I mention this because with the exception of being neurotic generally, this may be the only localization of disease in such cases.

Chorea magna, with its violent manifestations, wild antics, cataleptic states and epileptiform seizures, is very rare in this country.

HYSTERIA AND HYSTERO-EPILEPSY.

Hysteria may be met with in the young even of a few years of age. I have seen paralysis with stiffness in a girl only four. All the limbs were affected when she was admitted into the hospital. The paralysis entirely disappeared after two days without any treatment. The separation of the child

from her usual sympathetic surroundings was probably cause of the cure. We did not employ electricity, which cure more persistent cases. One limb is not unfreque affected. Its spastic condition may disappear by isolatio the patient from his or her parents and friends, or powerful f dic shocks may be needed. I have seen two or three cases were not cured even by chloroform anæsthesia. The foot bent to a right angle from the position of talipes equinus put up in plaster of Paris splints without a good result in cases, but a free discussion at the children's bedside abou knife and cutting off the offending member, resulted in a We should be on our guard, however, against terrifying children, for they may develop less curable neuroses. terical anæsthesia and pains and paræsthesiæ are als common occurrence.

M. Gayot and others have observed hysterical right h plegia and aphasia as early as four years of age, follow vi agitation. The children came of neurotic stock. The im ance of preventing terror and fright in children generally especially in those of neuropathic disposition, cannot be rated. It may be best to remove them from their na parents and guardians, and to place them with people children of more phlegmatic constitution. A great dea be done by mental and moral control or example. Gymn exercises of muscles and training of the fingers, voice mind should be systematically practised. A second may be thereby established which may even wipe ou worst features of the excitable neuropathic disposition.

BACKWARDNESS.

Backwardness may be due to epilepsy, severe illnes congenital defects. Backwardness glides into idiocy by perceptible degrees. The worst forms are closely like id Backward children are later in cutting teeth, learning h

of decency, sitting up, walking, talking, and performing such acts as washing and dressing themselves. It is difficult to fix their attention. Deafness may cause stupidity and backwardness, or inability to speak. The simplest propositions are only comprehended after more or less "drumming" and perseverance. Merely backward children do advance in the acquisition of knowledge and understanding, but the growth is more or less painfully slow. The education of any child is dependent on his surroundings. Precocity may be traceable largely to causes in the environment. Some parents are careful to place objects and subjects before their children, others never think of it, and leave the child to satisfy its own wants. A backward child left to itself remains more ignorant than need be the case. It is a good plan to examine the sense of hearing and powers of articulation in infants even before the twelfth month; for defects in hearing or in the external apparatus of articulation may simulate true mental deficiency.

CONGENITAL AND INFANTILE IDIOCY

I believe to be dependent always on coarse organic lesions or malformations. In necropsies of congenital idiots I have seen the following:—(1) The hemispheres converted into cysts, the head microcephalic, dolichocephalic, and keeled (scaphoid), and prow-shaped anteriorly. (2) Head good size and shape, except for a slight flattening on the right parietal region; right hemisphere greatly atrophied, almost certainly the result of hæmorrhage at parturition ("Clinical Transactions"). (3) Brain hard in patches, very small, diffuse arteritis indubitably syphilitic (see "Brain," 1885). (4) Large tumour size of orange in right hemisphere; head good shape, but rather small ("Patholog. Transactions," 1887). In many cases there is mere want of development of convolutions. In cases that come on in infancy the cortex is contused by a fall or blow, or damaged by syphilis

(see paper by J. S. Bury in "Brain"), hæmorrhages, thr
bosis, or inflammation (see Spasmodic Paralysis).

Idiots are often small in body as well as in mind, and r
be deformed in both mind and body also.

There are all grades, from simple dulness so freque
met with in capable citizens, down to the condition
anencephalous monsters. In moderate cases, the practitic
is consulted because of lateness in learning to stand, walk
talk. Besides mere backwardness, there may be perver
(insanity). Fits, or fits of passion, which, in my view,
not so far removed from one another, often occur.

CRETINISM

May be associated with idiocy. Here there is the
growth of myxœdematous tissue, and the features are p
much the same as those met with in adult myxœdema, th
they look stranger still in the cretin child. Loss of func
of the thyroid gland appears to be at the foundation of
tinism (see Victor Horsley's several Brown Lectures).

Atrophy of the thyroid is frequent in cretins. Fatty m
may be found in the posterior triangles of the neck
elsewhere. Much as I should like, I cannot enter fu
into the study of this disease in this book.

The **treatment** of idiocy and cretinism consists in atte
to hygiene and physical, moral, and intellectual educatio

Warm clothing and air are essential points, for their n
development appears to be distinctly dependent on the
perature. Idiots and cretins are at their worst in w
Their circulation is feeble; exercise and massage are,
fore, valuable.

Cretins should be removed from the locality in whi
disease is endemic. A well-drained soil is the chief cli
logical consideration, but attention must be paid also
urity of the water and to the presence of sufficient lig

The total vitality is low in idiots and cretins. The diet, therefore, requires regulation. The functions of the skin, lungs, and bowels are easily thrown out of gear. Bathing and exercise need special attention. Cold and damp are great enemies.

When all the corporeal functions have received attention we may turn specially to the cortex cerebri and its functions. Be it understood that the health of the mind or cortex cerebri is largely dependent on the healthy performance of the functions of all parts of the body, but especially on the circulation and digestion.

Having got the circulation and digestion in good order, we turn to the special and general senses. These are often obtuse and blunted. Their improvement depends on attention to the corporeal conditions and on education. The skin of a cretin feels badly; it feels still worse if the child be unhappy, be ill, or be cold. Happiness heightens the activity of all nerve structures, and promotes nutrition, and consequently education. Cold causes depression of nervous functions unless the system is strong enough to react against it, which is not the case in idiots or cretins. Cold interferes with happiness, and illness diminishes vitality; therefore these causes make the child less happy, and render it still more liable to suffer from depressing external changes.

Great is the benefit of gymnastic exercises for idiots and cretins, but they must not be carried to the fatigue point. Mental and corporeal exercises should be done methodically and carefully. They educate the cerebral and spinal centres, and in educating develop both classes of motor and sensory centres. The peripheral impressions react on the brain, and the brain reacts on the peripheral organs.

Amusements may be made to give instructions to the eye and ear. Music hath great charms for many of the idiotic class, and these children will do anything so long as they can listen to it. Some may be taught to play fairly efficiently.

Find out what the child likes most (his hobby). This is
fulcrum on which our levers should be worked. It may be n
to serve as a stimulant to education. The child is to hav
hobby if he will learn this or do that. If he fail, he is n
have his hobby, but if he perseveres and fails still, he may e
it for a while. Patience and perseverance will often e
wonders. But in this book I cannot go into the individual n
pulations and details of life in an idiot asylum. Let the re
go to Earlswood and examine on the spot for himsel
various methods, instructions, occupations, and amusem

SALAAM CONVULSION, SPASMUS NUTANS, NODDIN SPASM.

This clonic co-ordinate spasm is probably dependen
regular rhythmic nerve discharges from spinal centres.
head is bowed and the trunk bent forwards (salaam) pe
sixty times a minute. The rate varies in different cases
pathological associations are with epilepsy. Sometimes it
depend on a structural affection of the brain, say the
of a slight hæmorrhage. It may be the only affection i
child. Nystagmus may coexist, but it is often asso
with rickets, convulsions and epilepsy. The treatme
the same as for epilepsy. Hygiene, diet, and tonics a
great value since the child is often debilitated and anæ

There are other varieties of *head shaking* not on
infants during the first months of life, but also in th
the commencement of the second dentition. They
occur alone, and do not necessarily indicate serious ne
disease. They may be transient, but must necessarily b
to nervous discharges generally in the lowest motor cen

Head banging is simply a more severe form of the
kind of nervous affection. (See some interesting ca
Samuel Gee, in the St. Bartholomew's Hospital Re
Vol. xxii.)

CHOREA.

Spontaneous movements, inco-ordination of voluntary movement, and paralysis are essential features of all cases of chorea. Generally the *spontaneous movements* are the most marked; sometimes the *inco-ordination* is the chief phenomenon; sometimes *paralysis (paralytic chorea)* is *the* most obvious fact. The movements may begin in any part of the body, but the hand is often first affected.

In hemichorea the most volitional muscles (hand) are usually most involved. The *march* of the chorea from part to part may be from face to arm, to leg, to trunk, as might be expected from the anatomical arrangement of the motor cortical centres. This march is by no means always observed. The movements may crop up in different parts and altogether irregularly. The invasion may be rapid or more gradual. The bulk of the cases are of brain origin, and I believe of the motor cortex. Chorea should be regarded as scattered discharges of nerve energy less violent, more continuous than occurs in convulsions and motor epilepsy. As in epilepsy the paralysis is dependent on exhaustion of nerve cells. Defective nutrition of the nerve cells is the probable cause of the nerve discharge which produces movements.

Perhaps the bulbo-spinal motor nerve cells may be the primary seat of disease in a few cases. Whether the choreic movements are due to the nerve discharge direct from the cortex, the spinal motor cells merely acting as conductors, we do not yet know.

The defective nutrition of motor nerve cells may be brought about by rheumatism and vascular lesions—hyperæmia, anæmia, toxæmia, embolisms, thromboses; or by such explosive agencies as fright and terror; or as the effect of over-brain-work. The brain may come from a neurotic stock, or be of the neuropathic kind, from some cause or other (see p. 401). Girls in the second period

of dentition are more prone to it than boys. White
than black. The motor apparatus is the chief seat of ch
but the *sensory* and *mental* apparatus sometimes
simultaneously or successively.

There may be anæthesia or hyperæsthesia of the va
senses or delirium, apathy, perverted temper, &c. S
is usually worse when right hemichorea is most ma
probably because the chief centre for speech is abou
left third frontal convolution.

There are numerous varieties of chorea which it wo
out of place to discuss here. (See a paper by me
"British Medical Journal," Vol. i., 1886.)

Neither can I enter into the origin of cardiac murm
chorea. I hold that a good proportion of them
rheumatic and endocardial significance.

So far as the mere characters of the movements go
seen chorea in tubercular meningitis and hydrocephalu

Treatment.—General hygiology or the science of th
servation of health, promotes the health of the central n
system. Hygiene of the nervous system is as effec
promoting the health of the nervous system as
hygiene is. The special hygiene of the nervous
consists in avoiding all sources of irritation to the ner
centres. Blows on the head or falls are specially inju
the neurotic. Excessive expenditure of energy m
prohibited—competitive schooling, forced education
tional excitement, fright, terror. Any source of
irritation is to be removed: digestive disturbances,
bad teeth, masturbation. Pleasant surroundings are
in promoting brain health. Scolding and whipp
habitually looking cross at children, or bringing th
under too strict discipline, deteriorate the nutrition
cerebral cortex, and perhaps of other cerebral centres

Too little exercise of the special and general sen

not conduce to cerebral health. Too great exercise of the same is even more harmful. Strong impressions on special senses should be avoided, great noise especially, but excessive light also. I saw a case of chorea once that was attributed to the sudden sniffing of smelling salts by the child. She screamed and was much frightened by the peculiar sensation.

Any *digestive* derangement must be rectified straightway (see p. 35). The bowels must be kept daily opened; constipation and chorea are companions.

Anæmia is frequently present, and calls for such treatment as is indicated under that section. The importance of dieting, in view of the general debility, constipation, and anæmia, can hardly be insisted on too much. Much nitrogenous food should be avoided; in chorea the amount of nitrogen (urea) discharged is far greater than in health. But some meat should be taken, and it should not be salty, preserved or stale, but fresh. A little wine (ʒss.) with the dinner does much good in debilitated children.

Abundance of *fresh air* (p. 8), *cold douching* (p. 149), *cleanliness of skin*, *exercise* (p. 10), and *massage* (p. 470), and the obtaining of the requisite amount of *sleep*, are of the greatest service. The requirements of rheumatism complicating chorea must receive attention, and perforce alter treatment (see p. 119). The vast majority of mild cases get well on the above comprised treatment and sometimes even without it. If the case be at all severe the *rest* and *quiet* of *bed* is most beneficial.

Internal remedies.—Nervine tonics and alteratives.—Arsenic seems to me the only remedy that has much influence. I do not give large doses. Two or three minims of the liquor, with steel wine ʒii. t.d.s., is my commonest prescription for *neurotic* as distinguished from rheumatic and other choreas. It should be given regularly, and immediately after meals; the daily alvine evacuation aids the action of arsenic.

Nausea is often relieved by the drop doses of ars
extensive and intense pigmentation of the skin,
mucous membranes, may result from arsenica
chorea, should be borne in mind. The pigment
disappears on removing the arsenic. Tempe
complexion, I am sure, having something to
occurrence.

I think in very acute neurotic cases I have
from the *zinc sulphate* treatment, given in grain
times a day, and gradually increased—a grain a
vomiting sets in, when the doses are diminished
gradual fashion. Sometimes as much as ten gra
more, may be given three times a day before em
Dr. Dickinson used to employ this method frequ
useless in cases that have already lasted a month

Systematic *massage* of the whole body, las
minutes, once or twice a day, and not less than t
hours after food, for fear of disturbing digestion
with what I should call over-feeding, has been
successfully in acute chorea. I cannot think th
ministration of nourishment is a good thing in its
less, however, massage does use up much tissue.

I have employed massage even in cases of hemi
apparent good effect. The *food* should be nour
strictly subsidiary in *amount* and *quality* to th
powers.

Severe chorea requires treatment in *padded be*
cushions or water bed. The Americans recomme
in hammocks. Crumbs should be prevented fr
between the sheets, as they irritate the skin and
patient.

Sedatives to brain and cord, or both.—Chloral an
appear to be useful here. The movements seldo
altogether, but the artificial sleep does good. Wa

always aggravates chorea. The chloral should be given in three-grain doses for a child five years old. Its action should be narrowly watched. Bromide is best as the potassic salt and may be given in ten-grain doses, carefully watched. When deglutition is difficult, the nasal tube should be used both to administer food and to give medicine; or rectal alimentation and medication may be feasible.

Inhalations of *chloroform* for a quarter or half an hour three or four times a day has benefited severe cases; the vomiting that it may cause has been regarded as having a beneficial effect. The patients may remain asleep for an hour or more after each inhalation. Food should be given by the nasal tube whilst the patient is under the influence of the anæsthetic.

The *spinal ice bag* has relieved severe cases of chorea.

I have seen *tartar emetic* administered in gradually increasing doses, commencing with one quarter of grain, and up to the nauseating point, as with zinc sulphate, without obvious benefit. *Calabar bean* has been recommended in three to six-grain doses three or four times a day. *Succus conii* in ʒi. or ʒii. doses, repeated four to six times a day for children about seven, has proved of no value in my hands. A fiftieth of a grain of *hyoscyamine* has been injected subcutaneously, and taken internally night and morning.

Morphia in $\frac{1}{8}$ grain doses for a child seven years old may be injected subcutaneously in severe cases where sleep is prevented, but chloral or bromides are better.

Atropine (gr. $\frac{1}{1}\frac{1}{8}$ to $\frac{1}{2}\frac{1}{0}$) may be given with the morphia. Equal parts of Fowler's solution and distilled water have been employed for hypodermic medication by Fruehwald. The solution must be fresh and filtered just before being used. A minim was injected on the first day, and two on the second day and so forth, until eight or ten were daily injected, when the reverse process took place, the daily dose diminishing drop by drop. The skin was cleansed with thymol solution

before the arsenic was injected deeply into the tissues
limbs which were used in turn. Few local disturb
resulted. Tinct. of *belladonna* in large doses, ♏xx. t
t.d.s., has been highly praised.

Nitrate (gr. $\frac{1}{6}$) and *oxide* (gr. $\frac{1}{2}$) of silver t.d.s.
seen frequently used without obvious benefit in any ca

Valerian powders (gr. x.), *infusion* ℥i., *tinctu*
ammoniated tincture ʒss., have been employed, and s
fully, in girls about the onset of puberty. The valerian
soda, zinc, and quinine, of each about a grain, hav
praised by some. *Musk* gr. $\frac{1}{2}$ or tincture of sumbu
has been tried.

High is the value of *gymnastics* adapted to the
muscular apparatus specially involved.

It has been vaunted in the *cure* of chorea, but is fa
valuable as a *preventive*. For neurotic children (see
there is no natural therapeutic agency that is of mo
than careful training of nerve and muscle. (See th
on Gymnastics.) Seeing that the motor cerebral corte
most probable seat of most cases of chorea, the
resting, training and sleeping cannot be over-estimat

The special neuro-muscular apparatus to be tra
chorea are those that are most volitional, least o
and most recent. (See Hughlings Jackson on "E
and Dissolution of Nervous System"—"Bowman L
"Brain.")

Therefore the *articulatory* and *vocal* apparatus
careful calisthenics. Special hints on this subject
obtained from Morell Mackenzie's popular work. (
pp. 11 and 438.)

The *hand* movements, are exercised by definite
tions of movements, as in drawing, playing the pi
other musical instruments; knitting, sewing, or
wooden houses for younger children. Systematic

flexions, extensions, rotations, and circumductions of joints are easily designed.

General gymnastics and *outdoor exercise*, besides developing motor and sensory nerve centres, improve circulation, and respiration, and excretion. Fatigue must not be caused. These exercises are best done when the stomach is nearly empty, say about two hours after food.

Massage along the large bowel should be done about three hours after the best meal of the day. The idea is not to upset duodenal digestion. Similarly, brain work of any kind must be prescribed as though it were some powerful therapeutic measure or drug. Work of the cerebral cortex should be of the automatic kind during and for at least one hour after meals. The rationale is fairly, though not scientifically clear :—Action of the cerebral centres entails hyperæmia and nerve discharges in them. Digestion needs a definite amount of nervous energy to accomplish its ends. Energy is often inhibited or destroyed, or reduced to a low ebb by unhappiness or misery. The indications in the treatment of children are obvious; a child, like a man, digests more readily, and more, the happier it is at time of digestion.

LARYNGEAL CHOREA.

Very doubtful is it whether this is a pure neurosis. It is difficult to say whether slight catarrh is not present. Hyperæmia of the vocal cords has been seen in cases of the kind. Paroxysms of peculiar harsh coughing, ceasing during sleep, and difficulty in phonation are given as its characteristics. It may occur alone or in association with general chorea.

Electricity is said to cure it straightway. Faradisation, with a moderate current, one at the nucha and the other over the larynx should be practised for five minutes twice a day, best about two hours after meals, so as not to excite vomiting or cause indigestion.

Hygienic treatment is highly necessary. Attentio
be given to the food, clothing of larynx especially, ma
exercise, fresh air—to improve the general health, a
indirectly that of the nervous system. Consult the v
chapters on these subjects.

Local *hygiene* is of great value :—Systematic instruct
phonation, singing and reading aloud, in a proper attitud
to bring the vocal cords and accessory apparatus into th
possible position for functional purposes. The head
be erect, the face looking well forwards, the shoulders
and the chest free from all impediments to exp
Fatigue is to be avoided. This practised for ten m
twice or three times a day, *not* soon after meals, and
hot, stuffy atmosphere, will effect great good.

Various local measures have been tried. Insuffla
morphia, gr. ii. to 3i. Bism. Subcarb., requires c
Mopping the throat and top of larynx with various astri
as in diphtheria and hooping cough is also valuable.

Internally, bromides answer best. Belladonna and
have also been used, as in epilepsy.

SPASMODIC PARALYSIS, CONGENITAL CHOREA, ATH
HEMISPASM.

Under this heading may be included a group of af
that are all characterized by one fact. And that is *da*
the pyramidal tract. These cases are of common occ
in children. The symptoms, though always of the sam
vary immensely in extent and in degree. It is com
have spastic paralysis of both legs. The deep reflex
are present in abnormal situations and exaggerated, a
ankle clonus, even when the patient has never walke
affections may be of intra-uterine origin, may be co
and probably due to causes acting during parturition;
may come on after birth and at any time. More or less

ment of mind, up to idiocy, may coexist. Besides the tonic spasm or rigidity, there may be clonic spasm and inco-ordination of voluntary movement of the athetosis or choreac characters. There is always weakness or paralysis.

The lesion that damages the pyramidal tract, or prevents its proper development, frequently occurs in the motor cortex of brain. But it may occupy any part of the pyramidal path.

The causes of the lesions are numerous: want of development of motor convolutions and pyramidal tracts, or atrophy and sclerosis, the result of disease—either hæmorrhage or inflammation (meningo-encephalitis), or syphilitic arteritis or tumour. Many cases of holes in the brain—porencephaly—involve the cerebral motor path or centres. There are good grounds for believing that apoplexy into the motor cortex or subjacent basal ganglia may occur from difficult or instrumental parturition. In cases that occur after birth, the convolutions are damaged, and the pyramidal tract sclerosed as the result of, according to some, thrombosis of veins, according to others, hæmorrhage, and, according to yet others, inflammation. Thrombosis of veins may cause hæmorrhage into the brain as well as on to the surface. I think with Strümpell, that there may be a poliencephalitis of the motor cortex just like the poliomyelitis of the anterior horn of the cord. And this I regard as the pathology of many, if not the majority, of the cases of **infantile (cerebral) hemiplegia**, which is a very common disease of children, perhaps as common as infantile (spinal) paralysis.

These cases begin with fever and convulsions not unfrequently. Of course, thrombosis would explain the symptoms well enough; but the children are sometimes perfectly well at the onset of the disease. Doubtless, paroxysms of hooping cough may cause hæmorrhage into the motor centre or path. These post-natal cases are frequently unilateral, leading to spastic hemiplegia. In cases of cerebral paraplegia

or hemiplegia, the limbs do not grow well. There be considerable difference both in girth and length be limbs of opposite sides. Epileptic attacks may occu Dr. Hughlings Jackson's case of guinea-pig-like ep there was a hemiplegia, probably of cerebral origin. cerebral plegias are often spastic, perhaps always, and long course of time, especially when the paralysis h been perfect and absolute, mobile spasm and inco-ord rather frequently results (athetosis). The spastic par condition, with unequal affection of legs, has resulte cases of otherwise cured basic meningitis (Gowers). rare to have all four limbs affected, but the arms fre do not escape. When I say that I have seen at le dozen cases in the course of six years, it will be g that the cases are by no means uncommon. The hem that results from embolism and chronic tumours m the same characters in children. The pyramidal tra be simply atrophied or sclerosed.

The bulk of the cases have a tendency to get bette patient recovers more and more power over his stif limbs. Speech may be affected, and there is also t tendency to improvement of it.

The proper **treatment** (tumour cases are not co here) of these cases is education, both mental and m The child should be taught to speak and to walk b daily lessons in these arts. If the case be not se patient may possess the notion of putting one leg in the other when he is held out, by the teacher's hand under the armpits. Mechanical extension apparatus used if necessary, with a view to get the joints stra out of their flexed position. Sometimes there is *legged* progression, resulting chiefly from a spastic the adductors of the thighs. Indeed, the spasm is most marked in the adductors. Massage and fara

not to be used, for they simply increase the action of the already over-acting spinal motor centres. The constant current may be used daily as a sedative. Weak currents only should be employed, the positive pole being stationary and the negative moved about. Iodide of potassium may be given for long periods in small doses, and appears to do a little good. Fits should be controlled by bromides and belladonna as recommended for epilepsy.

Perseverance in gymnastic exercises of the limbs and of the muscles of articulation should be persistently and patiently advised. The child should be taught to attempt the enunciation of simple vocal sounds. Surprising success sometimes attends persevering efforts.

Cold douches are of but little service unless the general health be below par, which is, in my experience, seldom the case.

INTRACRANIAL TUMOURS.

Tubercular tumours are most common. Gliomata are not rare. Gummata are met with. I have seen a genuine hydatid in the right cerebral hemisphere of a child three years old. Cysterci cellulosæ occur. Cerebellar tumours are very common in children, and pontine gliomatosis is common. This used to be thought rare; I have myself made *six* necropsies ot such cases.

Caseous masses are most common, and in the cerebellum. They may cause no symptoms.

The symptoms of reeling gait, increased knee-jerks, rigidity, falling and tremor are in my belief the result of pressure on the pyramidal tracts. Headache, vomiting, optic neuritis going on to atrophy are far more common with cerebellar tumours than tumours elsewhere. This frequency is doubtless due to the confinement of the cerebellum in a comparatively closed chamber whose ceiling is the tentorium.

The vomiting is most frequently *paroxysmal* and *matutinal*.

The headache *occipital* and *paroxysmal*. Nystagmus, sq
ing, bulging of the occiput and hydrocephalus are com
symptoms. The first two are due to pressure on the flo
ventricle, and the last two to purely mechanical condi
(see Hydrocephalus). I have notes of three necropsi
cerebellar tubercular tumours in which the first sym
and death were separated by an interval of at least
years. From this I should say that recovery, so far as
life is concerned, is possible. An argument for cere
surgery is thereby also adduced. *Solitary* masses
common in the cerebellum and in the lateral lobes—addi
arguments for surgery. Cysts are also met with in the
bellum, and frequently without causing symptoms.
are frequently not genuine tumours—that is, they
occupy space which should be occupied by brain tissue

The *diagnosis* of intracranial tumours cannot be ma
the presence of headache, vomiting, and optic ne
Meningitis and blood conditions (as in chronic renal di
which may occur in children), and perhaps hæmor
may cause all three symptoms. Consequently diagno
"coarse" disease of the brain is not established b
trinity of symptoms. There is no difference between
dren and adults as to localization of tumours—no mor
I have already indicated as to frequency of site of tu
Bulbar palsy may be simulated by bilaterally symmet
cortical lesions, as in Dr. Barlow's remarkable case, w
also watched.

I found a large, dubiously gummatous, tumour in th
hemisphere behind the motor region in a female idio
five years ("Pathological Transactions," 1887). The
nothing to localize it.

The work of Barlow, Bury, and myself, proves bey
doubt that there is no syphilitic lesion of the brain (o
viscera) which may not occur in children, perhaps e

intra-uterine life. The *diagnosis* of the nature of the tumour is made by the attendant associations, rarely by nervous symptoms. Gliomata are usually apyrexial. Hydatids may exist in other parts of the body (Brailey's case, "Ophth. Trans.," 1887). There is usually historic or actual evidence of syphilis.

The optic neuritis may be uniocular, as in Brailey's case. Hughlings Jackson says the opposite hemisphere is diseased when the neuritis is one-sided—in his experience of three cases.

Treatment.—*Medical* is very serviceable when syphilis is at work. The treatment depends on the nature of the tumour and its situation. Iodide of potassium or sodium should be given freely for some weeks in as large doses as possible. Large doses prescribed all at once may disturb digestion, as has been experimentally shown for many drugs. Frequently repeated doses would be better. Remember also that the health must be maintained by every hygienic means in our power. Cod-liver oil may be given as for scrofula (p. 65).

Cardinal considerations are plentiful supply of fresh, not too cold or moist, air, careful clothing of body, and regulation of regimen.

Exercise may often be a possibility. Many cerebellar cases continue to play about in the intervals of freedom from pain and pyrexia. Sad, indeed, is the lot of those whose death is preceded by more or less complete blindness, the result of post-neuritic atrophy of the optic nerve.

Local inunction of lanoline ointment of mercury or ordinary blue ointment into the scalp is very effectual occasionally. Iodide of potassium ointment is used, but is very inefficacious. Oleate of mercury 5 per cent. painted on is certainly more cleanly than the other mercurials.

Brain Surgery.—If this treatment prove of no avail, and if there be no evidence of extensive tuberculization,

and if there be evidence of the situation of the tu in either cerebral hemisphere or cerebellum, it is only and just to get the careful and antiseptic surgeon to tre the skull over the seat indicated and to proceed as cir stances dictate. Consult the works of Victor Horsle "Cerebral Surgery," in the "British Medical Journal," I advocate trephining and excision of the tumour b complete aseptic method. Trephining alone has given relief from pain in a case of tubercular tumour c cerebellum (Goodhart). Cysts would almost certain completely cured by surgery. Trepanning as an explor operation is justifiable when the diagnosis of tumour is probable. (See also Hydrocephalus.) Cerebellar even than cerebral surgery, is in its infancy.

Expectant treatment.—Plenty of fresh air at the s for the scrofulous. Rest in bed whenever severe sym are present. A single free purge often relieves cerebr citement. The ice cap or Leiter's tubes may be to reduce excitement and abate headache. Feeding nasal catheter is to be practised when deglutition is di

Pain may be relieved by attention to the bowels, v tion and diet, and by cerebral sedatives—opiates of I powder gr. v., or chlorodyne ♏v., or better still chlora and bromide gr. x., in syrup or honey for a child o Headache may be combated by icebags or iced clot on or repeated; and by painting over an area of ski menthol (crystals dissolved in alcohol to saturation) or use of the solid liniments.

Vomiting is often relieved by the same measures as pain. Small doses of fluids given frequently, iced o vescing, are generally kept down. The horizontal p on one side may relieve vomiting and headache.

Constipation, often obstinate, may be relieved by aperients and small enemata (℥ii.) of soap and

Cascara Sagrada Liq. Ext. in pastils (Martindale) or capsules (Duncan and Flockhart), one or two a day, are very serviceable for such cases. Simple measures not powerful purges should be used—enema, suppository, rhubarb syrup, compd. liquorice powder, castor oil, decoc. of aloes, aloine, jalapine.

CONGESTION OF BRAIN.

Congestion of the brain of the active kind is probably associated with excessive action of the centres involved. Many symptoms are ascribed to congested brain, but the whole subject is ill understood, and I need not discuss it fully here. I shall, however, give an outline of an unpublished case that happened in my experience. A female infant, aged seven months, had right unilateral convulsions and paralysis lasting for four weeks, followed by recovery for a few weeks; next she had left unilateral convulsions and paralysis, from which she also recovered; finally, she contracted mild scarlet fever, from which she was recovering, when right unilateral convulsions again supervened, and she died after they had persisted ten days. The necropsy showed thrombosis of cerebral veins, with hyperæmia and spotted blood extravasation, limited to the following convolutions on the left hemisphere: Ascending frontal and parietal, parietal lobule, and supramarginal and angular gyri. There was no clotting in the longitudinal sinus; the thrombi in the veins were rather firm, but not adherent.

Were these appearances the cause, companions, or consequences of the convulsions? The rest of the brain was white by contrast. I should ask the same question if the hyperæmia were more extensive. Cases have been diagnosed as congestion when none has been found post-mortem; and congestion has been discovered at the necropsy when not suspected during life.

Treatment under these circumstances should be of the symptoms, without regard to theory, for the diagnosis is im-

possible. If there be heat of head, and the child be r
ice bags or Thornton's cap may be used to the head,
should be shaven if there be much hair thereon.
child be restless, and intolerant of noise and sound or
peripheral irritations, these must be abated as recomm
under Meningitis and Cerebral Hæmorrhage. Th
should be regulated in accordance with the fever and s
digestion. Fever requires a low diet of milk and barley
mutton broth, chicken and veal tea, &c. Vomiting and
are relieved by the usual means (see p. 319), and the
should be regulated by simple remedies. (See Diarrhœ
Constipation.)

Dr. J. Simon prescribes a week's course of bro
followed by a like period of suspension. In urgent ca
bromides should be given for two weeks together—a
to infants under three months, three to those abov
months, four above six months, and five to children a
year and a half. The potassic salt is used as being
stable and efficient than the sodic. It may be gi
aromatic water, with syrup. Special stress is rightly
keeping the bowels open. Sea air is to be avoided, a
noise, excessive light, or other peripheral irritation.

MENINGEAL AND CEREBRAL HÆMORRHAGE.

Meningeal hæmorrhage is not uncommon in th
born from prolonged labour and compression of th
Dr. Sarah McNutt has collected many cases of apop
the brain substance in such cases also.

The infant may die asphyxiated. If life be pr
cysts may form in the arachnoid cavity or in the brain
the latter situation a rusty, pigmented scar (porenc
may result and be the cause of congenital spasmod
lysis. Aneurism due to infected emboli from heart
thrombosis of cranial sinuses, or obstruction of t

tumours; paroxysms of hooping cough, convulsions, tetanus and cachexia however produced; purpura, and rarely aneurism—are given as causes of hæmorrhage both into the brain substance and into the meninges in children.

It will be remembered that many causes, and especially toxæmias, may produce symptoms like those caused by intracranial blood extravasation. Apyrexia is not always indicative of hæmorrhage, nor hæmorrhage always indicated by apyrexia.

Hæmorrhage may occur, and be attended with pyrexia when all other organs are healthy. The existence of thermogenetic centres above those of the bulb is probable. *Sudden* hemiplegia may be due to simple convulsions or tumour, as well as to thrombosis, embolism, and hæmorrhage. The hemiplegia merely indicates the seat of lesion.

Meningeal hæmorrhage may cause no obvious symptoms, and often there is nothing to enable us to localize the situation of the extravasation. Where diagnosis is doubtful, **treatment** can be only of symptoms.

Absolute rest and removal of all sources of irritation, in a cool, darkened chamber, will be safe directions. Watching the case—expectant treatment—is the thing. The bowels should be opened if constipated. This removes one source of peripheral irritation and of blood deterioration. I prefer not to use even a single dose of calomel in clear cases of cerebral hæmorrhage attended with sthenic symptoms in children. The bowels may be cleared by an enema of four ounces of soap and water, with a dram of castor oil. Indeed, no harm will result from free watery purgation, unless the child be greatly debilitated and cachectic, when the symptoms may be due to thrombosis or extravasation, and probably the former. The diet should be low, and consist of slops, without stimulants, if there is heat of head and pyrexia; or nourishing, and with stimulants, if there is collapse.

In cachectic states the infant may probably have
properly nourished, even at the onset of the brain symp
and the thrombosis may have occurred in spite of
feeding.

The head may be cooled, if hot, by Thornton's cap
ice bag, or cold cloths wrung out of iced water.
advise one or two leeches to the nape of the neck or
the ear, or dry cuppings. Free bleeding can only b
demned.

The head should be shaved if very hairy. If the vein
neck are engorged the head should lie high, otherw
complete horizontal posture is best, as tending to
circulation easiest, and to reduce the pulse rate. The
of the body should be kept warm, and especially the f
hands. Hot bottles may be used, but not in contact v
skin. The temperature of the room should vary w
presence or absence of fever, 50° if present, 60°
absent.

Feeding must be managed with skill, for there n
weakness of pharyngeal and laryngeal muscles, causing
ing or regurgitation of food through the nose. In o
avoid this the child should be fed lying on its side, so t
food not properly swallowed may flow out at the si
any trouble of the kind is best averted by feeding w
nasal tube.

During *convalescence* everything likely to conduce
perfect absorption of the blood clot should be remem
nourishing food, abundance of fresh air, &c. The hy
of the brain must not be forgotten. Excessive st
over-work of any kind, excitement, passions, and the
to be avoided or averted. Excessive stimulation of
sory nerves of special or general sense must be preve
keeping the child at the greatest possible repose.
obtaining of regular sleep is most essential. Iodide o

sium is not of service in such cases where the diagnosis is not dubious. It is far better to trust to general tonics. Iodide of iron may meet both tonic and absorbent indications.

I can only protest against the use of *counter-irritants* during the period of acute disease with severe cerebral symptoms. I have seen alarming blistering and ulceration follow the application of sinapisms to the calves of the leg and soles. Doubtless these results were to be attributed to defective innervation (trophic lesions), but the mustard must have had something to say in the matter. For the same reason, I think calomel or powerful irritant purgatives is best avoided, for it may set up a persistent diarrhœa, doubtfully due to ulceration, and conceivably also of trophic origin. The same considerations hold good when applying hot bottles *near* to the feet. I saw the foot of a child badly ulcerated from this cause. It was a case probably of hæmorrhage from which persistent hemiplegia resulted.

Quinine may be used in five-grain doses to subdue pyrexia, but I should prefer other means, as the ice-cap or wet pack. Quinine is said to be specially serviceable in the pyrexia that goes with embolism. But we do not know that quinine in such doses has any appreciable action on the staphylococcus pyogenes aureus or albus, the micro-organism that is regarded as the cause of many diseases besides infective endocarditis. The heart is frequently perturbed in cases of cerebral hæmorrhage. Bromides are valuable in arresting cardiac as well as cerebral excitement. Digitalis and belladonna may also be used.

THROMBOSIS OF CEREBRAL SINUSES.

The commonest causes are general prostration and local inflammation. The commonest cause of general prostration causing cerebral thrombosis is perhaps severe diarrhœa in infancy. Infants, any way, are more liable than older children. This thrombosis is almost always of the longitudinal sinus.

The commonest cause of local inflammatory throm
extension from ear-bone disease. This form affects
the lateral and contiguous sinuses. It is not specially
to infancy.

The symptoms of both forms are indefinite.
hydrocephalus or coma and collapse may be due to
haustive variety. Coma, convulsions, and delirium
due to the inflammatory kind. For treatment, the
referred to "Otorrhœa" and "Inflammatory Diarrh

TUBERCULAR MENINGITIS.

Meningitis from tubercles varies greatly in degree.
some of the symptoms are due less to inflammatio
local anæmia and congestion, the effects of arteriole
The causes are those of tuberculosis. Heredity is n
far as tubercle goes. The fatality of tubercular n
prevents direct heredity. Hooping cough and
are frequent precursors. Cases occur in the f
of life; but the period from the end of the first
ginning of the second dentition yields the larges
of cases. Contrasting strongly with simple meningi
sets in suddenly in the midst of blooming h
tubercular disease is *generally* gradual in its clin
mencement. But the premonitory symptoms
pathognomonic. They may be attributed with equa
to the belly as to the brain.

No disease is, however, more protean in its c
ment, course, or clinical characters. Fifty necrops
made of this disease. I have been far more struc
dissimilarity than the similarity of its clinical co
two cases are altogether alike, unless it be in the po
appearances.

Stages may be recognized; but often confusi
stages is observed. Remission or almost compl

pearance of symptoms is frequently observed. Sometimes this disappearance may last days, and occasionally months. I think also some cases end in recovery. "Irritation" and paralysis of functions may coexist, or the latter may come first. At times a series of irritative and non-irritative stages is observed in the same case. The phenomena of "irritation" are numerous. By "irritation" must be meant active manifestations. Non-irritation or paralysis means absence of activity. The typical difference is as between convulsions and paralysis or delirium and coma. The same cause may produce both irritation and non-irritation. It is usually conceded that action or irritation is due to a less degree of action of the same cause than is needed to produce absence of action, "non-irritation," paralysis.

The "irritative" phenomena are:—generally severe, and usually frontal, headache, with paroxysmal exacerbations (hydrocephalic cry), that may be spontaneous or induced by movement, noise, light or digestive disturbances. Vomiting without obvious cause and optic neuritis. Restlessness or perversion of behaviour; intolerance of smells, light, sound, taste, touch, movement; insomnia; delirium; various motor phenomena — twitching, tonic spasm, convulsions, rigidity; most of these may be ascribed to variation of the cerebral cortex. Concave or boat-shaped belly, grinding of teeth, squinting, irregular pupils; various vaso-motor signs—pallor, redness, tâche cérébrale; great heat of head; irregular, slow or very rapid pulse, and breathing; irregular, not severe, pyrexia. The temperature may be high in the morning or midday, but as a rule does not go beyond 102°. The chief non-irritative phenomena are great tolerance of everything, mental apathy, tolerance of movement, smell, noise, light, &c., drowsiness or coma, local paralysis, relaxation of muscles, constipation, involuntary micturition and of fæces even, if there be diarrhœa.

Coldness of surface with profuse perspirations, rapid and feeble pulse and breathing, which may be of Cheyne Stokes' character may be classed as paralytic phenomena.

Delirium with constant convulsions and shorter clinical course are more marked phenomena in the rare cases where the convexity of the brain is the seat of the meningitis; and death may not seem adequately accounted for by the post-mortem appearances. The ordinary basic form often runs on for three weeks, and even more than that. On the other hand death may occur in convulsions within a few hours of the onset, which may be sudden. Sudden hemiplegia may be first sign. (See a case reported by me in the "Clinical Transactions," Vol. xvii.) The amount of softening of the walls of the cerebral ventricles and of internal hydrocephalus vary in different cases. The explanation of this is uncertain. Spotty "capillary" hæmorrhages are frequently observed in the neighbourhood of small tubercles. Pathognomonic symptoms cannot be assigned to them.

Treatment.—Powerful antiphlogistics and counter-irritation have been and are still used as for simple meningitis, q.v.

Blood-letting, severe purging, free blistering, and mercurialization must all be condemned. Even former advocates of blood-letting now relinquish this practice in tubercular, though continuing it in simple meningitis. Active purgation is rightly regarded as useless by most authorities.

Expectant treatment is the best, attention being paid to the patient and to the symptoms.

All lowering measures are unjustifiable. Secure absolute rest for the mind and body, and an agreeable apartment and able attendant who is acceptable to the child. Try to secure rest in bed or on the couch in a capacious chamber, well ventilated, free from sanitary defects, and in the quietest possible position.

Lesions in other localities may modify treatment a little.

Open the bowels once a day, if necessary, with an ounce enema, or a dram of syrup of rhubarb or senna or liquorice powder.

Diet must be digestible and nutritious, with plenty of hydrocarbon (fat)—as much as can be got down and can be digested. Cream, milk, beef tea, underdone meat, pounded chicken, Mellin's food, custard, egg, bread-and-butter; all of these may be taken when fever is absent. Feed frequently and in small doses, especially when apyrexia is present.

Tonics.—Iron and cod-liver oil are valuable when there is no, or but little, fever. Some infrict cod-liver oil. It is uncleanly; simple oils are better. They may be rubbed into the axillæ, groins or abdomen, but not all over the surface of the body.

Specifics.—Iodine is so regarded by some. The tincture may be given in one or two-drop doses t.d.s. Some give iodides instead, or even with the tincture. The doses may be increased or diminished according to the effects produced.

Iodides, especially of potassium, starting with one grain t.d.s., is highly recommended by a great number of authorities. Large doses and long continued is the prevalent method; some prescribe it with liq. hydrargy. perchloridi. I certainly think such treatment valuable in promoting absorption of inflammatory matter. But no good influence can I conscientiously set down either to the iodide or mild mercurial treatment of tubercular meningitis. Diarrhœa may be dependent on iodism.

Iodoform in half-grain doses at the commencement has been prescribed, with the object of destroying the bacillus. It is worth further trial. Watch for sickness, collapse, and sweating. According to recent researches, iodoform is not at all antiseptic.

Several cases of tubercular meningitis are said to have been cured by the infriction of Ung. Iodoformi (1 part of

iodoform to 5 of vaseline) into the shaven scalp; ab
dram of the ointment is rubbed in twice a day, and a c
some impermeable material is constantly worn. Nine
days is the time required for a cure.

Sedatives and Antispasmodics.—Warm bath, T. 10
relieve convulsions. Bromide of potassium gr. v., is
greatly enhanced in effect by the same dose of chlo
syrup, for a child five years old. Fluid extract of Va
U.S.P. ♏x. frequently.

Opiates should not be used, unless all other mean
they may increase the distress and constipation. Son
poultices with laudanum and opium plaister.

A mustard foot-bath two or three times a day is
safe.

Counter-irritation.—Wholesale blistering or sinapis
barbarous; but an occasional blister or sinapism has s
to many observers to mitigate symptoms of excit
They may be put to the nucha, behind the ears, ov
heart, or on the calves of the legs. I do not recor
them in any way unless over the heart to treat a
syncope which occasionally occurs even in the pro
stage. Vomiting may be relieved rarely by a mustard
the epigastrium or nape of the neck.

Cold applications to the head are most valuable for
fever and restlessness, and causing sleep. They will o
lieve vomiting and pain. The head may be sha
close cropped. Wet cloths or lint under oil silk, irr
with Leiter's tubes, an ice cap or bladder and cold a
are all used. Simple irrigation is objectionable, as likel
the chest and bed. Cold affusion should be practise
bed. Hot fomentations and starch poultices have be
by some.

Prophylaxis.—Obtain the most perfect sanitation, h
and cleanliness possible. A phthisical mother should n

her offspring. Cleanliness in the matter of food and drink, which may become contaminated by the bacilli and epithelia from the breath of the ubiquitous tubercular poitrinaire, is clearly of the greatest moment. A germless and bright atmosphere is best for the tuberculously predisposed—sea air and mountain air.

A wet soil must be avoided; dry and porous is the best. Phthisis and tubercle flourish on a humid soil and atmosphere.

The diet should be as recommended for scrofula. Avoid cerebral excitement and excessive headwork. These children are ready scholars. Abatement and repression of mental and physical energy is to be practised rather than forcing. Such children should be made as happy as surrounding circumstances will permit. Some are generally well contented; others "grizzle" all day. Warm woollen clothing and careful dieting should be ordered, to prevent catarrhs. The neck and arms as well as the legs, chest and belly, should be carefully clad. Cod-liver oil should be taken as a food, and iron if there be anæmia.

The hair of the head, as in children generally, should be worn short, and the head gear not be too heavy. A woollen cap is best for the winter. The feet and hands should be kept warm. Gymnastics and exercise, with as much fresh air as possible should be enjoined, but short of producing fatigue. A large straw hat should be worn to protect the head from excessive sunlight and heat. Keeping open a seton or blister at the back of the neck or head cannot be advised under any circumstances. It would surely be a point for inoculation unless kept strictly aseptic.

SIMPLE MENINGITIS.

Simple meningitis is not very common. It would be rarer still if falls and blows on the head were prevented, and otorrhœa, carious teeth and disease of the nose with their bone diseases,

were rapidly cured. If septic causes were absent, perhaps simple meningitis would very rarely be seen. Acute specific fevers, erysipelas, and disease of the umbilical veins in the new-born may cause it. Sometimes it is of unaccountable origin. Infants are its most frequent victims. The symptoms themselves may not be essentially different from those of tubercular meningitis. They are often very few in number, especially in infants; the want of development of the brain may explain this.

CERVICAL OPISTHOTONOS.

This is a common symptom of disease in infants. It is frequently the only obvious evidence of basal meningitis. This meningitis is certainly sometimes syphilitic. I have made four necropsies of such cases in infants not more than seven months old. It it most common under one year of age. The meningitis is often chronic. In one case, aged four months at death, the infant had had retracted head for two months; occasional vomiting, incessant small movements of the right hand, rigidity of the left arm, *regular* pulse, about 100 whenever I counted it, temperature not above 100° whenever I took it, cervical opisthotonos worse at times than others, slight emaciation, retracted belly—were the symptoms. The under surface of the cerebellum was firmly stuck to the posterior fossa of the skull and to the posterior boundaries of the fourth ventricle, shutting the foramen of Majendie. The adherent membranes were opaque and of buff or reddish tint. There was considerable hydrocephalus, that had developed slowly; the fluid was clear. The child had had snuffles, but no other lesion; the ears were healthy. Convulsions are not uncommon. Strabismus and nystagmus sometimes are seen. Certainly cases, clinically resembling the above in all respects, do recover.

Cervical opisthotonos may be due to a rheumatic affection

of muscles, when there is always tenderness and more screaming or pain on attempted reposition of head. The symptom is often due to cerebellar tumour. Ear disease may be its cause, and many other peripheral irritations such as tender cervical glands, abdominal and other disturbance. But it seldom lasts more than a week unless there be meningitis or a tumour. The diagnosis of meningitis is surrounded with difficulties. The main ones have been indicated in this chapter and under "Typhoid Fever."

Treatment largely depends on the cause. In *infants* a few months old, syphilis should be suspected. The inunction of blue ointment or lanoline blue ointment into the back of the head is what I practise and advise. A small piece may be rubbed in every morning. A flannel cap should be worn. Care should be had in moving the infant not to increase its suffering. The head should rest on a soft pillow when the retraction is great. The suffering, however, does not appear to be severe in all cases.

Vomiting seldom requires treatment. Hydrarg. c. Cret. gr. i. may be given three times a day, placed on the back of the tongue, and rinsed down with a little water. This increases the effect of inunction, and may allay sickness. Sometimes fractional doses of calomel, gr. $\frac{1}{8}$, succeed better. Constipation is common. The gray powder does not overcome it often; but a little piece of soap into the rectum frequently does. Fluid magnesia ʒi. may be given, or syrup of senna, or a half-grain of aloine or jalapine.

Iodide of potassium may be prescribed, as well as the mercury, in one-grain doses, in water. This may be increased. It has not effected much good in my hands.

In *older children*, unless due to suppurative bone disease, or pyæmia, **simple basal meningitis** is not altogether hopeless. We have a good record of recoveries from almost undoubted meningitis; and recovery after nearly all hope had

past. These cases may be associated with otitis, and not with bone disease. In these mild chronic cases powerful antiphlogistic treatment is to be deprecated. Expectant treatment is the best. Mercury and iodides may be useful, but nature and nursing far exceed them in value. Blood-letting is almost never required. There is just the possibility of a couple of leeches proving beneficial in the paroxysms of excitement with great heat of head. But here ice-bags or Thornton's ice-cap is to be preferred. The wet pack is most useful under similar circumstances.

In the **acute meningitis** of older children, venæsection, leeches and dry cupping have gone out of fashion; and for the most part rightly. Instead of putting leeches to the temples or behind the ears, some leech or dry-cup the arms or legs.

Purgatives.—Calomel has been given in large doses frequently; this cannot be condemned too severely. A simple calomel purge to start with, say two grains for a child of four, and followed by castor oil, or given with Pulv. Jalapæ Co. gr. x. or jalapine gr. ii. is of value; but only when the head is hot, the pulse bounding, and the skin burning. After that the bowels should be kept in daily action by simple non-irritant purges—castor oil, syrup of senna, rhubarb, fluid magnesia, liquorice powder.

Antiphlogistics.—Mercury, either by inunction or in fractional repeated doses, is still employed by many. I have seen no good come of it in these cases. Calomel gr. $\frac{1}{6}$ or Hyd. c. Cret. gr. i. every four hours are common prescriptions. Some give it still more frequently.

Counter-irritants.—Mustard-leaves and poultices to the limbs and trunk are systematically used by some. An occasional sinapism to rouse the heart I do not object to. But systematic sinapisms are useless and may be productive of ugly ulceration.

Blisters ought not to be used. Authorities differ as to

their mode and time of application. They may be actually injurious from the induced sores. Some use them when the acute stage has subsided. M. Rilliet advised revulsion when meningitis follows a suppressed eruption. Of this I know nothing. He proposes pustulation by croton oil, and relates one recovery. The head should be first shaved. Fifteen to twenty drops of the oil are infricted over the scalp with a glove four to six times a day. The eyes must be protected. Such treatment I should style barbarous.

I advocate **expectant treatment.** The head should be shaved if there be much hair on the scalp.

Paroxysms of febrile reaction and restlessness are best abated by the application of cold to the head.

Sudden, not violent, affusion is very good. A pitcher of cold water (60°) may be poured over the head whilst the body is in a bath at 100°.

Thornton's ice cap or Leiter's tubes with a circulation of cold water is a most effectual method.

The wet pack is very valuable for violent excitement.

Quinine may be used for high fever, but I prefer the cold applications. I do not recommend quinine at all until the patient is convalescent, should such be the fortunate termination.

Delirium.—Chloral may be prescribed but should be carefully watched. A half-dram of the syrup or five grains of the hydrate with five of bromide may effect wonders in mild delirium.

Opiate sare decidedly useful: Chlorodyne five minims or Dover's powder five grains for a child five years old. Succus conii and hyoscyami are also used, but opiates or chloral and bromide are better.

Diet.—This should be low and unstimulating during the excitement stage or stages. Iced milk, frozen milk, or thin beef tea and light broths are good. The child may have

to be fed by the nasal tube or rectum (suppository of peptones).

In chronic cases the food should be nourishing—eggs, meat, milk, jelly, malted foods. Difficulty in deglutition requires very careful feeding, as in diphtheritic palsy, for the food may go the wrong way. Even if it do not actually choke the patient, bronchitis and pneumonia may result from minute particles entering the tubes; this is very likely to happen when the cerebral cortex is not acting normally.

The dorsal decubitus is not the posture in which to feed patients in any exhausting disease, for the neuro-muscular apparatus is weak, and imperfect inco-ordination readily occurs. The nasal method is the best whenever any distinct difficulty to deglutition exists.

Convalescence and recovery. — This, if it occur, takes many months; even years may elapse before the patient can walk alone or say many words.

Cold douches—the temperature to be regulated so as to cause reaction—are excellent tonics; but massage or shampooing and passive movements are our therapeutic measures in the early stage. Galvanism is useful; it is applied as in infantile palsy. The patient may be sat in the warm bath with plenty of salt therein.

There is no affection for which more can be done by shampooing, salt baths, &c., than such cases of recovery from meningitis.

The business should be taken in hand systematically. The ankles should be flexed as far as possible by the doctor every day. They may be very stiff and extended. He should strive to overcome the adduction of the thighs. And he should prevent dislocations of joints by strict attention to postures during the illness. Great force must not be used lest the skin be torn or other structures ruptured.

The skin is often very harsh, wasted, and scaly. The

warm bath every day will do something to remedy this, but the infriction of sweet oil or neat's-foot oil is very good. Such rubbing in may, indeed, serve as a supply of fatty food.

The skin must be kept scrupulously clean to prevent the glands from becoming choked at their openings.

When considerable progress has been made, corporeal and cerebral gymnastics should be instituted.

The child should be encouraged to stand and to try to walk (in a go-cart at first). Simple words should be tried, and repeated till properly pronounced. The atrophy appears to be quite as much nervous as muscular; the emaciation is often extreme, but may be followed by great fatness.

Later still, enjoin exercise in the open air. Useful apparatus are light dumb-bells and Indian clubs, if the child be old enough, and the horizontal bar or trapeze.

Still later, reading aloud for a short time is a good mental gymnastic, and the child should be diverted by pictures and conversation—partly to make it happy, partly to educate eye and ear or their cerebral equivalents.

OTITIS MEDIA.—OTORRHŒA.

Otitis media is common in children. It may give rise to symptoms (pain, fever, convulsions) indistinguishable from those of some cases of meningitis. Otitis may be a cause or companion of meningitis. Severe and constant pain in the head, which is almost incessant till the tympanum is emptied, is a special feature of otitis. In infants persistent uncontrollable crying is the sign of the pain. Objection is manifested to manipulations of the concha. The breast is refused, and the side of the head affected is burrowed into the bosom of the mother, or the softness of the pillow.

Purulent otorrhœa, especially of some standing, may cause thrombosis of cranial sinuses, cerebral or cerebellar abscess or suppurative meningitis. It probably does so by

direct extension of inflammation, with or without necrosis of bone. It is very doubtful whether genuine metastasis occurs independently of direct continuity of inflammation.

Some cases of otorrhœa are probably due to scrofulous disease of the bones of the ear. Scarlet fever is often followed by otorrhœa; measles also, but less commonly. The discharge may be offensive or positively overpowering. Suppuration in the middle ear is very apt to be associated with suppuration in the mastoid cells. The mastoid cells are but ill-developed at birth; that they are in direct communication with the middle ear must be remembered.

The commonest place for abscess to develop is the temporo-sphenoidal lobe and the cerebellum.

The clinical characters of brain affections resulting from otorrhœa and otitis are noways pathognomonic. All symptoms may cease after removing the pus from the tympanic cavity, or after trephining the mastoid cells. Usually the symptoms set in suddenly with high fever and convulsions, or chills in older children. Death may ensue rapidly in coma, with varying pulse and temperature. The signs may be all those of simple meningitis. Abscess may give fever, chills, or convulsions, headache, delirium and optic neuritis, with or without paralysis, according to its site.

There is no complaint in childhood that more urgently demands definite treatment than otitis and otorrhœa, and none that yields more readily to prompt and proper treatment.

All cases of convulsions and constant screaming in infants should cause the ears to be carefully inspected with the naked eye and speculum; if necessary, chloroform may be used to facilitate the examination. The external auditory meatus may or may not be simultaneously inflamed. The hand of the sufferer is by no means always applied to the ear. It is

said that mere inflation with Politzer's bag, with the nozzle in one nostril, and the other closed, will empty the tympanum of any matter it may contain. I have tried this method in even grown-up childen, with the aid of simultaneous deglutition, and I have considerable doubts of its efficacy in removing pus from the middle ear, though it is useful in mere deafness from Eustachian obstruction. The best way is to incise the membrana tympani with a very narrow tenotomy-like knife. The operation is really not very difficult. The aural or general surgeon may be specially called in. The relief that is afforded is instantaneous in acute otitis media. When discharge has already occurred the greatest desire should exist to have it dried up effectually. Many cases of not very offensive otorrhœa yield readily to syringings with warm water, just coloured with red Condy's fluid. The head should be bent over a basin, the mouth widely opened, and the fluid syringed with an indiarubber ball syringe and ivory nozzle of suitable size. The injection should be made slowly and with uniform pressure. If possible, the fluid should be got to run out of the nostril on the same side. That is the object of the position mentioned.

If the otorrhœa do not quickly cease, an insufflation of fine iodoform or iodol powder may be practised after each syringing, which should be performed two or more times a day, according to the amount of the discharge and the degree of its offensiveness.

If neither simple syringing nor iodoform insufflation succeed, antiseptic and astringent lotions may be tried; but caution is very necessary in their use. Giddiness may be easily set up; indeed, simple syringing may do this. Sometimes the use of the antiseptic lotion has appeared to develop the cerebral complications. Quinine lotion is very good; it should be warmed.

℞ Quinæ Sulph., gr. i.
Acid. Sulph. dil., ♏iii.
Aq., ℥i.

or sulphate of zinc in the same proportions.

If these means do not cure the case soon—say in a wee so—a thorough inspection of the ear, under chloroform, o to be made. Any polypi discovered should either be scra away or burnt with the actual cautery, or strong perchl of iron carefully used, so as not to be applied to a larger face than necessary.

Anything like necrosis or caries, with much funga material, should be treated *secundum artem* by the ca aseptic surgeon. A free way of escape for discharges sh be made, and, if necessary, gouging away of mastoid so as to obtain free and ample communication between t and the tympanum, should be practised. These case remarkably well with so-called "lasting" dressings. Al diseased tissue and bone should be scraped away and whole area rendered antiseptic by chloride of zinc sol and the free use of iodoform. A drainage of some should be inserted, and plenty of salicylic and iodoform used as an absorbent dressing; the whole wound sh then be sealed down with collodion, and bandaged firm prevent displacement.

When brain symptoms occur, the above surgical mea are of the utmost urgency, and the practitioner should s the aid of the surgeon, and go deeper and deeper still in brain pan in search of pus. The diagnosis may be dou Suppurative meningitis may be limited and surgically cu It is now well established that cases may recover abscesses in the brain and cerebellum after surgical ference. The chance of recovery in any other way is *nil*. If the parents refuse surgery, there is nothing to ept to treat the case as one of meningitis.

Otorrhœa entails a certain amount of deafness. The facial nerve may be paralysed as a result of its continuance. The *preventive treatment* of otitis is most important. During any acute specific, but especially scarlet fever and measles, attention should be directed to the protection of the throat and ear from local cold and damp. And if otorrhœa occurs in their course, it should be instantly treated by free and simple syringing. Cold and damp at any time, and from any cause, should be shunned when otitis or otorrhœa is present. A piece of absorbent antiseptic wool may be placed in the external ear to receive the discharge and protect from cold and damp, but not so firmly as to prevent the escape of matter. Sea bathing should not be allowed.

I have said nothing about hot fomentations, poultices, anodyne oils poured into the meatus, leeches applied to the concha or mastoid, or counter-irritations by blisters or iodine. These are very good for the meatal inflammation, and may palliate the tympanal, but there is nothing to equal the membranal incision. Nature bursts the membrane clumsily, and with great suffering. The surgical knife is infinitely better, for it relieves at once, and does not scar the membrane so much, and there is consequently less chance of impairment of hearing. Chloloform vapour has been recommended by Dr. Robb to relieve the pain of many ear affections. The vapour, but not the chloroform, should be floated into the external meatus.

In cases of actual necrosis of bone, the employment of astringent or other lotions should be prohibited, as likely to set up mischief in cranial membranes and sinuses. It is our prime object to prevent such a sequel.

HYDROCEPHALUS: CONGENITAL AND ACQUIRED.

The whole question of hydrocephalus requires review. One solid fact appears ascertained—complete cessation of

communication between cerebral cavities and subarachnoid space always causes hydrocephalus. Is obstruction at the foramen of Majendie, fourth ventricle or *iter a tertio ad quartum*, ever absent in hydrocephalus? I do not recognize external "hydrocephalus."

Pressure on the vena Galeni and other veins, increased secretion from lining membranes, and deficient absorption, are conceivable causes. All this I admit. Congenital hydrocephalus may be associated with spina bifida. The circulation of cerebro-spinal fluid may be interfered with by meningitis and tumours, possibly also by hæmorrhages. Cerebellar tumour often causes ventricular dropsy. It is favourably situate for obstruction of the cerebro-spinal circulation. I do not recall any case of fatal hydrocephalus in which this theory would not hold good. If there were no block, would not excess of secretion pass away? I do not think deficient absorption would ever be extensive enough to cause hydrocephalus. Let there be deficient absorption from the internal surface of lateral ventricles; the fluid could then escape through the foramen of Majendie and be absorbed elsewhere. Excess of ventricular fluid by its centrifugal tension ought to arrest secretion of fluid by diminishing the cerebral circulation. Such arguments may be fallacious. I regard hydrocephalus as a symptom, and not the whole disease.

A certain amount of ventricular dropsy may occur in general dropsy from heart or kidney disease, and from anæmia in rapid wasting; also from pressure on the veins of the neck. I do not think such cases affect the larger question of excessive hydrocephalus. The conditions just mentioned may be regarded as predisposing causes.

The symptoms of hydrocephalus are very variable. Rapid wasting or fattening is a curious one; so is the mental apathy —perhaps all these are attributable to pressure on the centres governing metabolism, whose chief site is the floor of the

fourth ventricle. Convulsions, tetany and laryngismus are not uncommon. Atrophy or œdema of the optic nerve discs may occur. Other symptoms are headache, giddiness, blindness, nystagmus, squinting, rigidity of neck or limbs, spastic paraplegia, and various vasomotor disturbances.

Diagnosis is difficult at the outset. When the sutures give way the laity can diagnose safely "water on the brain."

Treatment.—*Pressure* may be employed to promote absorption and to compensate for the disturbed circulation of cerebro-spinal fluid. Strips one inch wide of diachylon plaister, or Johnson and Seabury's elastic plaister, may be used. This practice requires caution. The pressure should be even and uniform. Some employ simple bandaging. Most of the strips of plaister are fastened on obliquely from one side of the occiput to the opposite side of the forehead. A few are placed horizontally from ear to ear; the whole are secured by a circumferential strap of plaister. Convulsions, syncope and even death have rarely followed such treatment.

Absorption of fluid and of the materials causing the obstruction may be promoted locally by the inunction of mercurial ointment or iodide of potassium ointment—oleate of mercury is more cleanly—and internally by the administration of mercuric bichloride, or mercury with chalk in small doses, or iodide of potassium in large doses, or the two drugs may be combined. Except in syphilitic cases I do not think there is much to be gained by this treatment.

Removal of fluid may be practised by paracentesis. All the instruments should be rendered aseptic. A very fine trocar and cannula should be used. They are passed into the lateral ventricle by puncturing the cleansed scalp about one inch to the left or right of the middle line, on a level with the site of junction of the sagittal and coronal sutures. Repeated tapping has occasionally been followed by cure.

The flow of fluid should be slow. As a matter of fact, the fine cannula usually employed, the difficulty is rath get a flow at all.

Dietetic and hygienic treatment consists in general ca ness as to food, cleanliness, clothing and fresh air. No special is required; wasting is sometimes very rapid. T of cod-liver oil and steel wine are valuable during valescence and recovery, should this be the fort termination. There is great hope of recovery in syp and some other cases. (See Cervical Opisthotonos.)

Tabes nervosa is a term applied to that condition of a when it remains persistently languid and torpid, without comatose and without there being any other sign of d either of the nervous system or other viscera. In one in a boy aged ten, which was labelled tabes nervosa Gee, I found at a necropsy, slight, very chronic men in the form of mere opaque thickening, with modera ternal hydrocephalus. There was no tubercle, and th men of Majendie did not appear to be completely There had been no history of sudden illness.

EXTERNAL HYDROCEPHALUS.

Local atrophy of brain, the results of hæmorrhage i arachnoid sac, and of inflammation of the dura m associated sometimes with some excess of fluid outs cerebral cortex. Hemiplegia or Jacksonian epilepsy some of the symptoms when the lesions are local an motor region. Asymmetry of skull or local thinness may lead to a suspicion of the existence of local collections.

An excess of subarachnoid fluid may be seen afte associated with general atrophy of brain. The diag often impossible.

Treatment.—Surgical is the only method. Tapp

been practised and repeated with success. But trephining and thorough examination by a careful aseptic surgeon is what I recommend, and this even when the diagnosis is not certain, but only moderately probable. Drugs are useless.

INFANTILE PALSY.—ACUTE ATROPHIC PARALYSIS.

This is most common under the age of two years. Acute onset with fever, extensive but regressive paralysis, and rapid wasting of muscle are very general features. The onset is not always sudden as a thief in the night. It may be two or three days before the paralysis has reached its greatest height and widest extent. Recovery is seldom or never complete. The anterior tibials, peronei, and deltoids are very prone to be permanently atrophied. The onset with fever and severe pains with tenderness has been diagnosed as rheumatism. Some swelling of joints has been observed in the painful limbs, and vaso-motor troubles with sweating, and even erythema, has been noticed, and have thus increased the rheumatic resemblance. Besides pains there may be spontaneous sensory disorders with feelings of numbness and tingling. It is not true that the sphincters are absolutely always avoided by the disease.

The disease is a cornual myelitis in the great majority of cases. Perhaps thrombosis, hæmorrhage, or embolism may cause the disease, or cause the myelitis.

The reaction of degeneration (loss to the faradic, increased and altered to the constant current of electricity), the loss of reflex action in the paralysed parts, and the rapid wasting may be due to disease of the peripheral nerves. But in this neuritis the atrophy of muscle is more irregular in distribution, the onset is more gradual, and there is usually coincident sensory disorder in the form of anæsthesia, and continued pains, &c. (see Diphtheritic Palsy). The febrile onset, which may be convulsive, may look like the commencement of an

acute specific. Cerebral convulsion is sometimes foll
by the paralysis of fatigue from exhaustion of the n
cortex. But here the deep reflex action in the palsied l
is usually excessive. The same fact holds good of cer
paralysis from organic disease, and the faradic reaction i
lost, nor is there rapid wasting of muscle. In infantile
the local loss of power is usually attended with loss of
action. As baulking the diagnosis, however, the par
may not at first be noticed in the midst of the general
tration. At the end of a week the characteristic reacti
degeneration may be found. The loss to faradism is *th*
The sound limb, if there be one, may be first tested to a
tain the lowest strength of current needed to cause contra
of muscle. The child may be placed under chlorofo
necessary; indeed, it is generally best to do so, both f
doctor's and the parents' sake. The loss of the knee-j
infantile palsy is a valuable sign. It occurs also in diphth
palsy and pseudo-hypertrophic paralysis. In hip-joint di
disease of the femur, periosteal hæmorrhage and syp
pseudo-paresis, the jerk is generally good.

Prophylaxis.—The necessity for taking care of inf
borne out by the occurrence of infantile palsy. We a
acquainted thoroughly with the etiology of the disease,
may not always be of the same nature. Summer sun
be shunned as much as possible, for the disease is
common from May to September, and there are grou
believing that sunstroke is a cause. Exposure to sever
and to wet or damp must also be avoided. This avo
of excessive heat and cold is simply part of the g
hygiology of the nervous system. The effect of heat o
speaking generally, is greater on infants than others.
often lie about on damp grass, and this has been a
as a cause of the palsy as well as of rheumatism, and
other diseases.

Over-exertion in boyhood, over-walking in infancy, falls and blows should be prevented. That teething and infantile palsy go together is admitted. Teething and rapid development of the nervous system are also companions. Bad feeding and cold-catching disturb the nervous system quite as much as they disturb the dentition. I think great hyperæmia and tension about a tooth may be regarded as a reflex irritant to the central nervous system. Ingenuity of intellect has plenty of scope in discussing the influence of dentition on infantile palsy. All are agreed that any cause tending to disturb dentition or the development of the nervous system should be averted. Robust health, however, does not prevent this palsy; but feeble health and actual disease are slight predisposing causes. The palsy may develop during the height of or after typhoid fever or ague, scarlet fever, measles, bronchitis, pneumonia, or diarrhœa.

Febrile onset, with convulsions, must be treated by rest in bed and a low diet. Actual convulsions call for the use of the hot bath (99°) for ten minutes, so as to depress the activity of the circulation and to act on the peripheral nerves with a view thereby of controlling the nervous centres.

Before paralysis has occurred the case will be obscure. Diaphoresis by the hot bath, in which a tablespoonful of mustard may be placed, will do something to relieve the heat of skin and convulsions; and half-dram doses of liquor ammoniæ acetatis, freely diluted, may also be administered. Paralysis demands perfect rest. Anything that calls forth the activities of the spinal cord must be avoided at least for a week, when the onset was febrile and sudden. Each muscular contraction—which may be excited by mere touches, by shakes of the cot, or disturbance of any kind—causes hyperæmia of the corresponding reflex spinal centres. Such hyperæmia can only be harmful if our view of the pathology of the complaint be

correct. Movement which alters the shape or position of the spinal column may do harm mechanically by jarring the inflamed cord, or by interfering with the flow of blood. Congestion of the cord is diminished by laying the patient on the belly. This posture should be adopted wherever possible.

Leeches, dry cupping, hot fomentations, mustard plaisters (prevented by muslin from acting directly on the skin), hot water bags may be used as counter-irritants, and may tend to relieve the congestion of the cord, seeing that the blood from the skin and other structures behind the spine goes into the same venous plexuses as the blood from the cord does.

Spinal icebags have also been tried with a view to reducing hyperæmia by the cold. The bowels should be acted upon by a watery purge of ten or twenty grains of Pulv. Jalapæ Co.

Whether drugs have an influence on the morbid process in the cord is difficult to discover, for there is such a remarkable and such a variable tendency for spontaneous subsidence and disappearance of symptoms to occur. Liquid extract of ergot in ten-minim doses three times a day has been prescribed in the early stage with a view to reduce the hyperæmia and the tendency to hæmorrhage. Hyd. c. Cret. gr. i. or ii. t.d.s. has also been employed; so has belladonna in large doses. Iodide of potassium is generally conceded to be valueless. Aconite is recommended in drop doses to control the initial fever.

Local mercurial inunctions.—Though there is no great tendency to the formation of bedsores, yet cleanliness and care of the skin should be seen to, by altering the position of the patient from time to time, by the use of water beds and by the removal of stale crumbs. Involuntary micturition and defæcation require most careful and prompt cleansing of the parts, not only for the sake of the skin, but also for preventing impurity of the atmosphere.

When all signs of irritation and acuteness have passed

away, say, at the end of two or three weeks, tonic treatment should be instituted. Iron, quinine, and strychnine are the most useful tonics; but the last should not be given till decided recovery is taking place, for it undoubtedly leads to excessive action of the motor bulbospinal centres.

Massage I believe to be far more useful than electricity. The limbs must be kept warm at all costs. Cotton wadding does this best; it should be warmed before being applied. When the child goes out hot bottles should be taken in the perambulator or carriage, but they must not be in contact with the limb. Vasomotor and trophic disturbances may be set up in the paralysed limbs by excessive friction, with stimulating embrocations or by the injudicious application of heat and electricity. Even simple massage seems at times to develop wheals like those of urticaria.

Massage systematically carried out is most important and most beneficial. It is no use playing with it, however. It should be made a thorough business of, and not neglected once even now and again without some very obvious reason. On a leg or arm the following movements should be practised:—They should be taught to an intelligent mother or father or nurse. The massage should be made twice a day at least and for not less than twenty minutes. The movements are done with a view to firm squeezing of muscles, not to painful pinching of the skin. All the movements begin from below and work upwards—from foot to hip, from hand to shoulder.

The child should lie down on a bed if the whole limb is to be massaged, or may sit on a chair or on the parent's lap if only the leg is to be done.

The first movement is one of squeezing and rubbing firmly, but not painfully, with the whole palm of one hand, grasping first one side then the other, or the whole limb at once if it can be surrounded. The left hand should hold the foot

whilst the right grasps and rubs the limb from below
wards. It is best to rub with the dry hand. But nea
foot or olive oil may be used if the masseuse or masseur
not attained the requisite skill. When the thigh and butt
are involved this firm rubbing should extend from the a
up to the buttock. It must be done thoroughly.

The second movement consists in squeezing the mus
and skin between the thumb and forefinger firmly, but no
as to give pain. All the movements should be done delibera
The foot should be included in this movement. The fin
are to be placed under the foot or leg or calf and the thu
in front; the soft parts are then firmly but gently sque
out between the fingers and thumb. Sometimes the bal
the thumbs accomplish this better. The muscles and
should be flattened and widened as much as possible wit
giving pain, but yet firmly and slowly. The movement c
mences at the foot, and gradually passes up the whole limb
should include the buttock.

The third movement is like the wringing out of sh
The rubbing and squeezing are done neatly and compl
round the leg, each hand working in the opposite direct
the grasping is effected by all the muscles of the opera
hand.

In cases of talipes equinus the most important pa
movement of all is flexing the ankle joint. The right
is placed over the front of the child's knee joint; the
of the left hand is placed against the sole of the child's
and the foot is pushed up so as to bend the ankle.

The tapotement or flipping should be of the whole su
of the limb from below upwards, and it should increas
hyperæmia already developed by the previous three n
ments. The front and back of the fingers are used altern

Finally, a gentle rubbing and friction is done all ov
limb both upwards and downwards, but only the skin is

acted upon. This soothes the stinging due to tapotement or tapping.

Important adjuvants and adjuncts to the massage are the clothing and bathing. The limbs must be kept warm, and massage is one means to this end. Knitted woollen stockings, woollen overalls outside these and reaching all up the limb are necessary; and also a lining of cotton wadding to the stockings if they are insufficient to keep the limb warm. For the night time a flannel cotton-wool-lined "cosey" made to the shape of the limb and reaching from toe to hip is very serviceable.

As to the baths, a large pitcher of hot water (105° F.) containing two handfuls of salt, or Tidman's sea-salt, should be poured down the leg and thigh twice a day after the massage. This should be followed by a similar quantity of cold water poured over the leg and thigh. And, finally, the limbs should be rubbed thoroughly dry with a heavy but soft towel, and the rubbing should be continued until the limb is perfectly warm, when it should be immediately wrapped up as directed. These movements and methods may or may not be of Mosengeilian manner, but I have learnt them from Dr. Thomas Barlow, and have practised them with but slight modifications for several years, and with the greatest possible benefit; but, as I have said, to be effectual one must work at them one's-self, and get the parents or nurse to work at them as though their neglect would entail a catastrophe, and this indeed, is not an exaggerated view to take.

The *constant current* is useful by causing contraction and congestion of muscles and hyperæmia of the skin. Warmth and nutritive changes are thereby promoted, as by massage, though I think systematic massage more valuable than electricity. Electricity fails to arrest the rapid wasting of muscle. The faradic current may be used to those muscles that will respond to it. But those muscles will [illegible]ver if they

retain the faradic reaction during the stationary period the case. It is an interesting fact that the voluntary impu may pass along a nerve in which faradism has not yet covered the power of causing muscular contraction.

The strength of the constant current should be very sl to commence with, for it often in infants and children cau emotional excitement, with severe screaming which can exhaust the nervous system. By gradually accustoming child the strength sufficient to cause cutaneous hyperæmia slight muscular contractions will soon be attained, and sh not be transcended.

Large poles should be used and composed of well we big sponges. The positive pole is the stationary one, should be pressed close to the sacrum or lower part of the when the legs are to be galvanised, or to the back of the when the arms are to be done. The negative spong stroked up and down and over the whole surface of the Make and break of the current are thus effected gradually do not cause much pain. The child may be accusto to the novelty of the procedure by not using any elec current at all at first, but merely playing with the wetted poles. The electrical treatment may be begun weeks after the onset of palsy. It should not be emp before this time lest the cord congestion be increased only by the electrical stimulation, but also by the emo excitement.

Those muscles that do not respond to faradism a ones in which contraction should be caused by the u the constant current.

In other parts of the limb the hyperæmia of the and muscles is all that is required.

Should the paralysis have involved the trunk muscles stipation may prove troublesome; or if the muscles chest and back be paralysed, a mere catarrh of the

may be a source of danger. In these cases care should be taken to avoid cold-catching by careful covering of the cutaneous surface of the throat, chest and belly by flannel or warm woollen material.

The proper performance of massage will do much to prevent the development of muscular contractions and club feet, and of wasting of bone. The employment of weight extension by stirrup and straps of plaister may prevent the flexion of the thigh on the belly and of the leg on the thigh. The employment of passive extension and a Scarpa's shoe will tend to overcome the talipes equinus. Mechanical appliances are valuable only when they enable the limb to be used.

The one great object of the doctor, of the parents and of the child should be to use the muscles as much as possible. Any few fibres of a muscle that is for the most part atrophied and paralysed, may be hypertrophied and developed by constant use, not carried to the fatigue point. Moreover, a vast amount of benefit often results from compensatory hypertrophy of other muscles. This compensation may be so considerable that positive wonders may be effected. It is of no use giving casual instructions. The doctor should be earnest and serious in his manner of dealing with the case; he should explain the chronicity of the affection to the parents, but he should also adopt an attitude of optimism whilst insisting on the incessant, uninterrupted, sedulous, assiduous, nay, religious carrying out of the clothing, massage and electrical treatment. The limb *must* not be allowed to become cold and blue; the massage *must* not be neglected, nor the passive movements, exercise or electricity. Tenotomy may be necessary and also mechanical appliances, but for these important measures orthopædic works should be consulted.

Strychnia (gr. $\frac{1}{100}$-$\frac{1}{30}$) has been injected under the skin

and into the muscles of the paralysed limb. I have s this method used without obvious benefit. The injection r be made daily or every other day. I regard it as triflin importance and not worth the risk of causing local turbances.

Belton Massey advises in the initial stage blisters over small of the back when the legs are affected; or at the n of the neck when the arms are involved. Revulsives h been applied to the affected limbs. This, in my opin should be done with the greatest caution, for fear of indu trophic lesions. When the blistered surfaces are healed gentle, constant current should be applied over the back two or three minutes, the poles being placed close toge the positive being above the negative; the current sh be interrupted by the commutator, so as to cause contrac of the spinal muscles. In my opinion actual vesica should be avoided.

Nitrate of silver gr. $\frac{1}{8}$ t.d.s., in pillule, for a child a year has been lauded by some. Care should be taken not to duce pigmentation of the skin by long continuance of drug. It is usually voted valueless. Minute dose strychnia, gr. $\frac{1}{100}$ in pillules, twice or thrice a day, is sa have completely cured in a few weeks cases that res all other treatment. This I should strongly doubt.

BELL'S PALSY.—FACIAL PALSY.

Pressure of instruments during delivery, "rheuma inflammation from local action of cold, as in riding i draught in a railway compartment, inflammation assoc with otitis or otorrhœa, are important causes of total f palsy in childhood. Thus the disease has the s causation as in the adult. The symptoms are precisel same as in the adult, including the reaction of degenera This latter is not always observed in the rheumatic c

which may recover before any loss of reaction to faradism occurs. The first two causes are favourable to recovery. Recovery never follows the last form when there has been extensive ear disease. I agree with Dr. Gowers in not having seen palatal palsy in association with paralysis of the facial nerve. It is said that the petrosal branches of the facial nerve supply the palate. This is very doubtful (see Gowers' " Diagnosis of Diseases of the Brain," p. 92). True taste is lost in the anterior two-thirds of the tongue, when the nerve is inflamed before the chorda is given off.

Facial palsy from forceps pressure does not need much treatment. The face should be carefully protected as in any infant. Galvanism can rarely be needed for it. It usually subsides spontaneously, as a rule, in less than a week.

Rheumatic paralysis should be treated by the constant current, by protection of the face from cold, by stimulant embrocations, care being taken not to overdo them, and by gentle massage along the course of each muscle.

The positive pole of the constant current should be placed on the nerve trunk over the ramus of the jaw, and the negative should be stroked about the face. The strength of the current should not exceed one microampère, at all events at first. If the muscles act to faradism this may be used of the weakest strength necessary to evoke contraction. I have treated half-a-dozen such cases in children with faradism from the first, and there is no risk whatever.

IDIOPATHIC MUSCULAR ATROPHY.—PSEUDO-HYPERTROPHIC PARALYSIS.—DUCHENNE'S DISEASE.

Boys are chiefly affected, and frequently more than one boy in the family. Yet the disease is usually transmitted, like hæmophily, through the mother. The disease may have commenced during the first two years of life, but usually later; even as late as puberty, but this is rarer. The hypertrophy

of muscles is due to an overgrowth of the fatty and fibrous interstitial tissue.

Essentially the disease is an atrophy of muscle. Probably it is a myopathy, not a neuropathy. Cold and damp and acute specific fevers should be avoided as they have been set down as exciting causes.

The difficulty in walking, and especially in going upstairs, is a marked symptom.

The small size, absence, or atrophy of the latissimus dorsi and lower part of the great pectoral has been insisted on by Dr. Gowers; my own experience of eight cases corroborates this.

The pseudo-hypertrophy attacks chiefly the calves and buttocks, the deltoid, and infraspinati. The mode of rising from the floor and walking in a fairly marked case are almost pathognomonic. For a complete account of the disease, with illustrations, the reader should consult Gowers' "Manual on Diseases of the Nervous System."

Congenital spastic paraplegia may be mistaken for pseudo-hypertrophy, for the constant spasm causes considerable hypertrophy of the calves and legs. But in the spastic disease the knee-jerks are excessive instead of being weak or lost; the mode of rising from the ground is not the same, and the tendency for pseudo-hypertrophy is not to get better, which is the opposite of what happens in the spastic disease.

Cases of idiopathic muscular atrophy occur without hypertrophy; the face may be atrophied in these cases, "myopathic face." This is not the case in pseudo-hypertrophy. The two forms do not occur, as a rule, in the same family. Harpooning the muscle by means of a Duchenne trocar with a view to detecting fatty and fibrous overgrowth is not absolutely trustworthy. The **treatment** is not encouraging. The chronicity of the complaint makes a belief in temporary arrest by the means employed easy to establish. I have employed faradism and galvanism, but without appreciable

result. The mode of using these agencies is described under Infantile Paralysis. Massage and gymnastic exercises are perhaps the best means for endeavouring to strengthen the muscles which have not yet been involved, and also as tending to improve the whole system. But these measures are powerless to prevent the muscular atrophy. "It is possible that (exercise) may, to some extent, divert the trophic energy from the interstitial tissue, since cessation of muscular exercise is certainly followed by quicker failure of strength" (Gowers).

The passive movements, massage, and exercise are useful also in lessening the tendency to spinal curvature, talipes equinus, and other deformities and muscular contractions. Tenotomy of the tendo Achillis may be employed if the foot cannot be placed flat on the ground after a course of massage and passive extension. "Tenotomy may restore the power of walking for some years, and when contracture returns its removal has a second time set the patient on his feet again" (Gowers).

When the back and chest muscles are wasted, the danger of pulmonary catarrh is increased. Great care should be taken to prevent the patient from catching cold. Every hygienic measure that tends to improve the general health, and the health of all the organs of the body, should be adopted with the utmost obtainable efficiency. Special care will also be required in the treatment of any intercurrent affection which may arise. Arsenic and phosphorus may be prescribed as for Rickets, but neither they nor any other drug has any appreciable influence on the disease.

CHAPTER XVI.

ACUTE SPECIFIC FEVERS.

GENERAL TREATMENT OF FEVERS.

Pyrexia profoundly perturbs the physico-chemical
cesses of the protoplasm. Of the nature of the perturb
we are but imperfectly informed. The thermogenetic ce
and tracts doubtless control the situation. The therap
may influence the loss of heat from skin and lungs, o
act directly on the nervous controllers of thermogenesi

The removal of all restrictions to the action of the v
functions of the body is essential. We must husbar
vitality by allowing the nervous system, heart, lungs, ar
liver, kidneys, bowels, and skin to act adequately
occasion, but by keeping the expenditure of energy
lowest possible pace.

Consequently all cases of fever are best treated b
fining the child to a cot in a capacious chamber at the
the house, with a single nurse, who must be capable, c
physique, and pleasing presence, and whose dress sho
agreeable to the child, and composed of linen or mus
large fire in the room secures ventilation, though apt t
currents of air that cause unequal warming of the
Sanitary stoves will doubtless displace open fires in the s
future. The room should be kept as a rule at a temp
of 65° F. day and night. A uniform temperature
the least demands on the various functions of the body
is important, because the heat-regulating machinery is
out of gear in fever. Abundance of fresh air, not t

nor too cold, aids the action of the emunctories by oxygenating the hæmoglobin sufficiently, and by carrying away from the body the various volatile emanations. The air must not be fouled by the chemical, physical, or vital emanations or evacuations of the child or nurse. Everything in the room and about the child must be scrupulously sweet, and therefore of such material as will bear the being cleaned. The furniture in the room should have plain and smooth surfaces, so as to allow of washing.

The object of cleanliness is to lessen contamination of the atmosphere, to promote perfect perspiration, and aëration of blood, and to prevent poisoning of the atmosphere on which the patient has to live. The child fouls the bed and bedding by volatile, particulate, and visible emanations and evacuations. This fouling prevents the perfect performance of protoplasmic processes, because such emanations and evacuations require a certain amount of expenditure of energy to enable the child successfully to resist their deleterious action. To live in such an atmosphere is not so easy as to live in a germless, untainted, pure air, such as may be got on the sea or at mountain heights. Our object in fevers, as in other illnesses, is to restrain every influence which increases the demands on the vitality of the child. It is well to have two cots, so that whilst one is being cleaned and aired the other may be in use. There should be no superfluous furniture; no curtains or carpets. Dirty linen soiled by vomit, or stools, or sweat; plates and dishes, should be sent away as soon as possible. Foul linen and napkins should be steeped in antiseptics—chloralum ʒi. to gallon or Condy's fluid. Absence of noise is nearly as important as absence of dirt and foul air. Noise discharges, *i.e.*, wastes, the energy in the cerebral cortex and other nerve centres, and acts also probably disadvantageously on the other processes in the body, as when it causes palpitation, restlessness, sweating, &c. The child must be diverted

without being excited, for excitement increases fever when it is present, and depresses vitality at all times.

The bed should have a tolerably firm mattress. Feather beds should not be used. Crumbs must not be allowed to get between the sheets. Care must be taken to avoid long-continued pressure and irritation of the prominent points. The good nurse always prevents bed sores. They do not readily form in children, owing to the vitality of the tissues, but constant cleanliness and care should be exercised all the same. The bed should be of fair size to allow of plenty of room if the patient be restless. The bed clothing should be changed as frequently as may be necessary to keep it sweet and clean. The mattress and palliasse may be exposed to fresh air and sunlight, and in order to disinfect it may be baked in a proper disinfecting stove at a temperature of at least 212° F. The importance of proper drying and airing of all the bed linen and child's linen should not be forgotten.

The bed covering should be light, not to prevent the escape of heat and emanations, but at the same time sufficient to prevent unequal chilling of surface or a feeling of coldness.

Excessive light should be guarded against by plain shades and inside venetian blinds or shutters. It has been shown that light, especially the actinic chemical rays (violent end of spectrum), increases metabolism—an action we try to avoid as much as possible in fever. The nurse's clothes should not be of woollen material as this entangles bacteria, germs, particles of epithelium, &c., and is, therefore, less easily disinfected than linen or muslin. The furniture above recommended makes disinfection easier because of the absence of nooks and corners. The cot may be of iron or hard wood, for these materials may be kept sweet and clean. It is a good rule to have basins of disinfectants about the room and a sheet damped with 1 in 40 carbolic acid hung

over the door. If they effect no actual destruction of germs they serve at least to remind one of the necessity for cleanliness and for isolation from other people. A grass mat or two on the floor looks more comfortable than a bare board, and these are easily kept clean.

The duration of quarantine is indicated under each acute specific fever.

It is preferable, wherever possible, to send infectious diseases to the London Fever Hospital, Liverpool Road, N., or some similar institution in the country. The Mary Wardell Convalescent Home for Scarlet Fever is at Brockley Hill, Stanmore, Middlesex. For hospital patients the Metropolitan Asylums Board may be telegraphed, and an ambulance will be sent.

After the expiration of the appointed quarantine period the child should be bathed and washed with carbolic soap, and leave all his presumably infected clothes behind him as he leaves the room. Some well-aired, perfectly fresh and clean clothes should be ready in an adjoining chamber.

The apartments or ward that have been thus vacated must be thoroughly fumigated by burning sulphur after closing doors, windows, chimneys, and other openings. An ounce of sulphur for every cubic metre of space. The furniture should be washed with strong solution of chloralum (3 ozs to gallon) or with carbolic acid 1 in 40. The floor should be scrubbed with carbolic acid soap. All wall paper should be torn down and burnt; and free ventilation obtained after the sulphur fumigation. All the ceilings and walls should be washed with quick-lime and whitewash. The walls should be eventually repapered. All wood-work should be cleaned with carbolic soap; everything that is washable should be steeped in solution of chloralum or carbolic acid and boiled. If Condy's fluid be used, the sheets, &c., should be immersed and afterwards thoroughly

rinsed in cold water to prevent staining. Where washing is impossible disinfection is best done by dry heat for several hours in a public hot air disinfection chamber at a temperature of 250° F.

Articles of trifling value, such as rags, &c., should be burnt completely. Linen and fast-coloured clothes may be hung up in the sulphurous acid fumes.

Epidemics in schools require the existence of a quarantine ward, which should be kept sweet and clean, well warmed and aired. All the children should be carefully watched and their temperatures taken night and morning. Isolation should be practised on the appearance of any one symptom.

Antipyrexia in childhood.—Sponging the surface of the body with cold (60°) or tepid water (80°) is the best and gentlest method for children, who, however, bear great heat better than adults. There should always be a mackintosh beneath the under-sheet, or beneath the under-cover in every child's bed. The sponging should last about ten or fifteen minutes at a time.

The temperature is best taken in the rectum of infants, and the mouth of older children if nothing prevents. The water may be used much colder than the above mentioned, and may even be iced, especially when the spongings are applied to the head, or the parents seem to object to an actual cold bath. The whole body may frequently with advantage be immersed in a bath of which the temperature may be 95° at first, and gradually reduced to 70°. It is very important to give these baths one's self, and to do it carefully.

Shivering is an indication for removal of the child. As a rule the temperature of the bath should not go below 60° unless the (rectal) hyperpyrexia prove obstinate. It is to be remembered also that the temperature goes on falling for a half-hour or so after removal from the bath.

Ten minutes in such a bath is an outside time. The child

should be rapidly dried. It is unnecessary and undesirable to put it into blankets. The bed-clothing should be as light as is consistent with circumstances.

After the cold bath the temperature must be closely watched; the thermometer being used on the slighest indication. The temperature should always be taken at least every four hours, but when hyperpyrexia is about, every two hours, or even every hour. The effect of the bath is often decidedly depressing, even the resulting cyanosis and collapse may be considerable and lasting. The extremities should be wrapped in cotton wool, and hot bottles used if collapse be present; and hot grog is useful, ʒi. of brandy in warm water or milk.

It may be necessary to give *stimulants* before, during, and after the immersion. The cold bath, though a valuable method, requires care and judgment in children more than in adults. The number of functions on which it acts, and the profundity of the peripheral impression on the neuro-muscular apparatus is very great.

Another useful way of reducing fever is by the *water-bed* on which the child is placed, a sheet or blanket only intervening. The child may lie on its back or belly. A stream of water may be kept flowing through the water-pillow or bed. The method requires care and attention.

The *wet pack* is very useful in abating fever and restlessness in children. The cloth is wrung out of cold or tepid water; the child is swathed in it, and then blankets are wrapped round the sheet-enveloped child. The pack should remain about fifteen minutes or less in an infant. Modifications of this system may be used locally. Cloths wrung out of iced, or cold, or tepid water (compresses) may be applied to various parts of the trunk, and may cover a certain area at a time.

Thornton's cap, or an ice cap, may be used to the head as an antipyretic. If Leiter's leaden tubes are used as they

may be to the head, throat, chest or abdomen and joint
water circulating through them should not be iced, un
very powerful effect is wanted. For the lead acts as a
ductor of heat and the part cools very rapidly.

Intestinal irrigations even of iced water are also empl
They are highly praised, especially in acute inflamm
diarrhœas. A Maw's irrigator may be used, or a
cistern with a syphon arrangement. (See pp. 322, 333,

Quinine may be used in large doses at long interv
an antipyretic in children—say five grains for a child two
old. Some give it in two-grain doses frequently. I
be given by the rectum in a suppository. *Salicylic acid* i
grain doses every hour is also used as an antipyre
children say seven years old. But if there be c
debility or albuminuria it should not be used. I cann
commend it under any circumstances.

Antipyrin is much used nowadays. Ten grains o
may be given to a child seven years old; or a grain fo
year of the child's age. But this must be done with ca
It has at times a depressant action on the heart as
on the nervous system. Vomiting may be excited
Sweating generally occurs. A morbilliform or scarlati
rash of no serious import sometimes follows its ad
tration.

Antifebrin has also been employed. Four grains
infant (Bernheim, age not stated) caused collaps
shivering, lasting two hours. Two grains is a usu
for a child of five. Antipyrin, antifebrin, and sali
are most useful in painful acute pyrexial rheumatism,
is rare in children.

Kairin has been used to reduce the temperature in
fever, pneumonia, scarlatina, and other fevers.
ministration requires caution, for collapse has follo
use. The dose is three grains to a child five years o

may be cautiously increased in amount. Pulse and respiration fall as well as the temperature, and sweating occurs. The reduction of temperature varies in different cases, but is seldom more than three degrees F. The general opinion, in which I concur, is that it is of but little value. *Thalline* has an antipyretic effect, though this does not last long. It may be given as a dose of a few grains in a watery solution, and seldom causes nausea, or vomiting, or diarrhœa, but the sudden fall in temperature may be ushered in by cyanosis, and profuse sweating may ensue. It, too, will probably not continue to hold a place in children's therapeutics.

Inunctions all over the body of mutton fat, cerate, lard and vaseline, have been tried for the reduction of pyrexia. In young infants their effect appears to be greater than in older children, but the fall is seldom more than two degrees in any case. I cannot think the practice a good one, for it may be that the inevitable obstruction to perspiration leads to blood changes, which, though they act advantageously on the thermogenetic centres, may prove deleterious in other directions. The method is inferior to the application of cold. Perhaps the mere friction may do almost as much good as the inunction.

Food in fever in childhood.—During fever the food must be unstimulating and mostly in a liquid form, but all the proximate principles of food should be supplied. The largest possible amount of surface is thus presented to the action of the gastric juice. Feeding should be done "little and often," as this taxes the neuro-muscular and secretory apparatus of the stomach and duodenum least. It may be necessary to peptonise and malt the foods. Mutton broth and beef tea containing proteids and hydrocarbons, but little carbohydrates, should be thickened with well-boiled or baked flour, or Savory and Moore's food, or better with Mellin's soluble food. Milk may be too heavy alone; its

casein may be guarded by isinglass, gelatine, gum acacia or the time-honoured barley water. Where beef tea causes diarrhœa, chicken broth, veal tea, or vegetable soup—a carefully strained—may prove invaluable as in typhoid fever and in scarlatinal albuminuria, where the pure animal broth may be too irritating to the bowel and kidneys.

Stimulants are not always needed in the treatment fevers in children. A bad type of the epidemic of fever, low vitality of the child, call for stimulants at the outset. There is no hard and fast rule as to the amount of stimulant. A disproportion between the pulse and temperature, not due removable nervous excitement is as a rule an urgent summo for stimulants. A tongue tending to dry, or a skin to swea at the outset of the case, or coldness, dampness and blu ness of surface, or a depressed fontanelle are usually deman for stimulants. Good brandy or port wine (or white wi whey for infants) are the best stimulants. They should given with soda water, or milk, or water. The quant needed varies with the case. And half-a-pint of champag or six ounces of high-class brandy, or whiskey, or wine, m occasionally be required in twenty-four hours even in childr only a few years old.

I have insisted on cleanliness of the most aseptic descr tion for the child's external environment. But the sa principles apply to its internal environment.

The mouth and fauces must be cleansed every day at le with tepid water and a soft tooth brush. It is a good plan have the mouth rinsed out after each meal. The rectum m be cleared every day as a rule, with simple enemata. Rec irrigation with an Eguisier syringe is indeed excellent, a has been used as an antipyretic, very cold water being e ployed. Of the necessity for keeping the skin clean I h perhaps said enough. When there is much perspiration i important to change the linen even more than once a c

Care should be taken to see that the linen is dry, clean, and well aired. Linen is better than flannel during the active period of most fevers, unless sweating be severe. During convalescence a woollen vest and a belly protector should be worn.

SCARLET FEVER.

Isolation is very effectual in preventing its spread. The patient may not mix with others till all desquamation has ceased. This means six weeks' isolation at least. The stage of red eruption I believe with Dr. Dickinson to be a very contagious period.

Scarlet fever affords a striking instance of idiosyncrasy. Some protoplasms are more liable to it than others. Robust health (see typhoid fever) may even predispose to it. It is a potent predisposer to nervous diseases, not of organic sort. Epilepsy is frequent after it, and may also be rendered worse by it, if present before. I like to contrast this with typhoid fever, which frequently does the opposite—removes a neurotic tendency, disperses chorea, and even epilepsy. The whole nervous nature is sometimes changed by scarlatina and typhoid fever.

Scarlet fever comes out within a week of exposure to the infection thereof; surgical scarlatina may be of but a few hours' incubation.

The *diagnosis* of scarlatina is not as a rule difficult: Sudden onset, vomiting, high fever (103° F.), rapid pulse, punctiform, uniform rash well within 48 hours, strawberry tongue, sore throat, and large glands are sufficiently characteristic in a typical case. Simple sore throat, simple erythema, rötheln, measles, diphtheria, and ague are stumbling blocks in atypical cases. Some pyrexia is necessary to the diagnosis, unless it be the malignant variety, in which severe cerebral symptoms (coma and convulsions), with collapse and a mottled blue skin, usually terminate

fatally in a few hours. Surgical erythema is almost cert
scarlatinal.

A *membranous sore throat* in scarlatina is far
œdematous about the soft palate and fauces (gelati
translucent look) and very early marked; this and the su
febrile onset usually puts diphtheria out of court. Si
membranous or follicular tonsillitis may cause a difficulty
they never have a bright red punctiform rash, and but r
a diffuse erythema. Drugs may cause curious consterna
such as copaiba, which with cold nitric acid causes a
cipitate in the urine. Heat and alcohol dissolve it.

The **treatment** of the simple forms of scarlatin
simplicity itself. The carrying out of the treatment desc
on p. 229 will suffice. A very rapid pulse in scarlet
unless accompanied by other signs of serious import
call for stimulants. Typhoid fever on the contrary
have quite a slow pulse with high fever.

In scarlatina anginosa, with more fever and a trouble
throat, careful watching, attention, and expectant treat
are required. I shall consider the treatment of scarl
under various headings. The remedies and methods t
prefer and recommend come first in each section.

Prophylaxis consists in the avoidance of all cas
scarlatina and all neighbourhoods in which it is rife.
water should be boiled, and also all milk. There is incre
evidence to show that this is a striking source of convey
of the disease. Exposure of milk and water in the scarla
sick room is also to be prevented, for germs and epit
may fall into these liquids. Perhaps the cow is the ori
source of the disease (W. H. Power).

Food and stimulants.—A supporting plan of treatme
always called for in well-marked scarlet fever:—Strong
a, milk, meat essences and extracts, brandy, eggs, ea
minense (whites of two eggs, half-a-pint of cinnamon w

a little sugar), mutton broth, jelly, blanc mange, &c. The liquids should be thickened with soluble carbohydrate, preferably Mellin's or well-boiled Savory and Moore's. Frozen beef tea or milk is good when the appetite is poor, the mouth hot, and thirst distressing. Early appearance of the typhoid state demands free stimulation ; but often proves fatal.

Great swelling of the neck, large hard parotids, and a plastron of brawny infiltration, or a sloughy throat interfering with deglutition, and perhaps respiration—may be rendered less distressing by hot and numerous poultices and by glycerine of belladonna paintings. Plenty of brandy and champagne, as indicated by the state of the pulse, tongue, and brain, may be required. And the patient may have to be fed by the nasal catheter and by nutrient enemata and suppositories. Bleeding should on no account be practised.

Topical treatment of throat and nose.—Relief of thirst and of the sensation of dryness may be obtained by ice or iced water, by small quantities of acidulated but not sugary drinks, such as lemonade, orangeade, acetade (very dilute acetic acid), raspberry vinegar and water, freely diluted sulphuric acid, or hydrochloric acid, with a little glycerine. These are refrigerant also. A little glycerine and honey with borax applied from time to time give relief. Effervescing draughts of soda water, cold carbonic acid water, certainly give great comfort sometimes.

Accumulations of sticky mucus about the throat are also alleviated by the above means, and by steam inhalations, which should always be used under the tent bed when the throat is bad. Heat and moisture with ventilation may be secured as for severe bronchitis. Carbolic acid, terebene, sanitas or eucalyptol, may be used as sprays.

Nitrohydrochloric acid, very dilute and sweetened with honey, is recommended by Waring for gargling and internal administration.

Nasal discharges should be treated by greasing the nostrils and upper lip so as to prevent excoriation. Scrupulous cleanliness should be maintained by the removal of all secretions. Scabs should not be allowed to form. Oily preparations, not water, ought to be used.

The *nasal passages and nasopharynx* require as much attention as the *throat.*

Syringing or douching with dilute antiseptics, such as Condy's fluid, or chlorine water, or chlorinated soda, checks and sweetens the secretions, and relieves diarrhœa. Sprays (steam or hand atomisers) or gargles, if possible, may be used instead, both for the nose and throat. Sanitas, carbolic acid 1 in 50, terebene ʒi. to ℥i. of water with ʒi. of spirit, resorcin and carbolic acid may be tried, as in hooping cough; lime water or solution of salt (ʒi. to Oi.) are used as nasal douches. These soften the mucus and matter, and aid in the removal of crusts. They should not be practised so as to exhaust the child.

Insufflation of iodoform, as a cleanser, deodoriser and antiseptic, is best when other means cause struggling. Finely-powdered iodoform may be blown on to the throat and into the nose by Mayer and Meltzer's instrument; or an ointment of gr. xv. to ℥i. of vaseline or geoline and a dram of eucalyptol, may be put far up the nostrils with a camel's-hair brush. When there is much weakness glycerine preparations or mere dusting with powder cause less disturbance, and have a more prolonged effect, because they adhere to the parts.

Inhalations of sulphurous acid have no special advantage. The vapour of acetic acid has been used for the throat, but is of no special value. Alum gargles (gr. x. to ℥i.) and sprays are useful, but no better than other agents. Gargles of tinct. of capsicum ℨi. to Oi. may be of service in the relaxed state

supervening on the acute. A solution of Ferrous sulphate ʒi., glycerine ʒiii., may be employed with a brush as a local application to the throat (Lewis Smith).

A gargle of acetous infusion of sanguinaria, ℥ss. of the fresh root to Oi. of vinegar, is recommended by Jennings.

Boroglyceride or boracic acid and glycerine is a useful antiseptic for the nose and throat; it may be applied with a brush or mop.

Escharotics are not recommended as a rule. Strong nitric acid, applied to the sloughs in the throat, can seldom be required. Hydrochloric acid and the solid stick of nitrate of silver have heen successfully tried.

Severe cerebral symptoms and *malignant forms of scarlatina.*—For the malignant forms, with collapse, coma, convulsions, hæmorrhages, and purpura, no good remedy has been found. A hot mustard bath (100° F.) should always be tried and repeated. Cold water affusions to the head are good. Bleeding cannot be recommended. Teaspoonful-doses of yeast frequently repeated have been highly commended in malignant cases. They should at least be tried.

Compression of carotid arteries has been recommended for convulsions: the right artery when the left side is convulsed, or both alternately when the convulsions are bilateral. It seldom effects any good.

Whether blood-letting by venæsection will ever again be practised must remain an open question. I should never advise depletion by blood-letting. No, not even a few leeches for the throat. It would be powerless to save the malignant cases, and could only weaken in others.

Tincture of veratrum viride (♏v.) or veratria gr. $\frac{1}{12}$, to lower temperature and control convulsions, would require careful watching; it acts like aconite, but seldom does good.

External applications to throat.—Poultices are best when

the throat is sloughy, and there is much swelling, interferir with deglutition and respiration; they should be frequent renewed; but only give comfort.

Cold wet compresses may be used when the swelling not great. Or hot fomentations are equally useful. Slic of salt pork sewn to a single fold of linen and put to t throat from ear to ear, the band passing over the vertex, wi camphor powder and salt sprinkled on the pork to increa its irritant action, are said to be good (Lewis Smith a Leuf.) Local applications should be renewed frequently, s every two hours and care must be taken to prevent cl during their removal and re-application.

Abscesses or suppurations require immediate resort to t surgical knife; they must not be allowed to burst spontar ously. Even extensive suppuration and sloughing may recovered from. All instruments employed in the openi of abscesses should be thoroughly clean and rendered aseptic as possible. Aseptic methods are always advisabl

Chronic ulceration of fauces and pharynx may main. It is best treated by change of air, good fo digestible nutritious diet, and a little wine or claret v dinner. The ulcers should be kept sweet and clean syringing or gargling, and occasionally stimulated by solution of nitrate of silver gr. v. to ʒi. distilled wa applied by means of a camel's-hair brush.

Bleeding from throat.—Sloughing or ulceration at time may lay open a large branch of the external car artery. Small hæmorrhages may be controlled by ice local pressure, or by local styptics; perchloride of iron c mop of cotton wool is best. The common or exte carotid artery may have to be tied. Pressure on the comr carotid in the neck controls the hæmorrhage, but local p sure should preferably be employed.

Balneology is practised to reduce pyrexia; to bring ou

rash; to remove collapse; to relieve cutaneous irritation, restlessness and delirium. Sponging the skin with tepid water is effectual in relieving the cutaneous irritation, abating the pyrexia and bringing out the rash. A more powerful means for effecting all these changes is the cold wet pack.

The cold douche may be used for hyperpyrexia. It should not be used when there is profound collapse, with blue skin and feeble heart. For this state the hot mustard bath should be tried; cold affusion or a Thornton's cap to the head often controls hyperpyrexia.

Hot baths (100°) should be used once a day to promote desquamation. They are also recommended in the early stage of dropsy. The child should be removed from the bath and wrapped in a large sheet to prevent chill. Sponging the skin with dilute acetic acid, with a view to preventing the spread of fever to others, has no special advantage over plain sponging.

Hot air baths promote diaphoresis when the skin is hot and dry. They are valuable in uræmia.

Internal remedies.—*Tonic.*—Iron is the best.

℞ Tinct. Ferri Perchl., ♏x.
Glycerini, ♏xx.
Aq., ʒii. t.d.s.

for a child of three.

It strengthens the protoplasm, improves the blood and promotes the healing of the throat.

Antiseptics are less valuable, but require further investigation. Ten minims of chlorine water may be given every six hours to a child of five, or five-grain doses of sulpho-carbolate of sodium, or hyposulphite of soda several times a day; they are useful occasionally, but have more action over septic than scarlatinal processes.

Antiphlogistics for the throat are highly praised by some. Aconite tincture in drop-doses frequently has not any special

value in scarlatina. Hyd. c. Cret. gr. $\frac{1}{8}$, or Calome fractional doses, given every hour, for great swelling of tonsils, and to convert malignant into simple sore throa of no value in my belief.

Aconite is of value however in great excitement o nervous system and circulation associated with a dry It soothes the nervous symptoms, and favours sleep b diaphoretic action. Dr. Ringer avers that aconite co inflammatory complications, but he rightly doubts whet can lessen the severity or diminish the duration of the He advises its employment if any rise of temperature o during convalescence. I prefer the wet pack to aconite

Alterative (?).—Chlorate of sodium (gr. iii.), with hydrochloric acid and honey, syrup or glycerine, may b instead of chlorate of potash (gr. iii.) ; it is preferable potash salt. I do not use them in scarlatina except as ga I believe their prolonged use may lead to anæmia hæmorrhages. Undoubtedly, large doses may cause h turia, albuminuria, and cardiac depression. Some pre the chlorate as a drink, and prize it highly as a clean the tongue ; others say it is most valuable at the end disease.

Antipyretic drugs.—Quinine may be given in full and is perhaps the most useful. Antipyrin in five doses, frequently repeated, for a child five years old, may collapse. (The admixture of it with sweet spirits o causes the development of aniline blue.) See p. 488.

Some recommend digitalis to be prescribed with anti for their action on the heart is said to be antag though it is doubtful whether antipyrin always acts cardiac depressant.

Benzoate of sodium and salicylate of sodium in ter ses for a child of five, are recommended. Some pre rmer. Neither are of much value in my experien

it is averred by some that the former is a *safe* antipyretic. The doses may be repeated every hour, but their effect should be carefully watched. Salicylic acid in five-grain doses has also been used.

For *remedies to relieve restlessness*, see the paragraph on Balneology. Bromides in five-grain doses, with or without chloral in similar doses, made less objectionable by syrups, may be prescribed for children seven years old. They require careful watching; smaller doses should be used for younger children, but both drugs are, as a rule, well borne.

Pulse indications.—Feeble circulation and delirium: Carbonate of ammonia (gr. ii.) or solution of acetate of ammonia ɱx. every six or eight hours. These are useful, and may be given in milk.

Soft and feeble: Sir Thomas Watson prescribed half-dram doses of solution of citrate of ammonium frequently.

Digitalis is employed by some in large doses when the temperature is high and the pulse rapid and irregular in a weak child. It must be prescribed in doses of a few minims of the infusion or tincture with caution.

Specifics, curatives, and *prophylactics.*—Belladonna is useless as a specific, though a few still cling to it. Bromides may prove serviceable to secure rest, but I do not believe they have any specific action on the scarlatinal throat.

Tincture of capsicum internally in two-minim doses can only be of value in convalescence.

Carbonate of ammonia is useless as a specific (see above). Alkaline sulphates of soda and potash, and magnesium are not now, though they used to be, considered curative and prophylactic. They may ward off albuminuria and other sequelæ.

Dram doses of infusion of digitalis every few hours. This should not be practised without careful attention. It will probably be seldom of much value; as an antipyretic it is

not to be recommended. There are safer and more certain methods of reducing pyrexia. It is said to be still more valuable when uræmia sets in. Poultices of digitalis leaves have been applied to the belly and back in uræmic convulsions. It may be useful in myocardial dilatation.

Emetics.—Mustard and ipecacuanha, &c., have been used after the initial vomiting. It is asserted that a favourable influence is exerted on the further course of the malady.

Desquamation (see p. 497) is promoted by washing every day with coal tar soap and by giving a hot bath (100° F.)

Constipation rather than diarrhœa is the rule in scarlatina. Castor oil or Gregory's powder are best, and may be disguised in warm milk or gelatin capsules, respectively.

Inunctions.—(1.) To relieve cutaneous irritation, reduce fever and promote sleep. (2.) To promote desquamation and prevent contagion. The following may be used:—

Mutton fat, cold cream, carbolic oil 1 in 50, vaseline, cerate or geoline. Glycerine may be mixed with these in varying proportions, and eucalyptus oil may be added as an antiseptic and scent. Glycerine of borax as being antiseptic may be used instead of simple glycerine. I do not take kindly to universal inunction either for the early or desquamative stages. They must diminish the exhaling and excreting functions of the skin, and so increase a liability to disease of the kidneys and other excreting organs by throwing on them an excess of work.

There is no objection to relieving the tension of the palms and soles by the infriction of geoline or vaseline, with a dram of eucalyptol to the ounce.

Joints and serous membranes may be inflamed during the course of and after the decline of the fever; rarely the joint swelling may precede the rash. These inflammations may be relapsing during the fever. They may be "rheumatic," but suppuration is not infrequent. Cold wet com-

presses may be applied to the joints and to the sides in pleurisy for the relief of pain. If there be definite effusion the joints should be wrapped up in cotton wool and firmly bandaged with flannel.

Salicylates may be tried, but often fail unless there be much pain and pyrexia. An opiate may be given if there be restlessness and sleeplessness. Dover's powder is best; three grains to a child three years old, repeated according to circumstances. Mere pyrexial albuminuria does not preclude the use of the opiate, though actual nephritis generally should. Quinine in small doses is far more valuable than salicin or salicylates in my experience.

Otorrhœa is very common in and after scarlatina.

The ears should be syringed twice or three times a day with warm water coloured with Condy's fluid. They should be carefully dried after each cleaning, and a small plug of antiseptic salicylic wool introduced just to guard the external meatus and absorb discharge. If the matter be highly offensive a little finely powdered iodoform blown into the external auditory canal is good.

Powdered quinine, or salicylic acid, or boracic acid, glycerine of carbolic acid or of tannin, are useful stimulant and antiseptic applications.

The syringing may be done with warm spirit lotion ʒi. to ℥x. It is said to be more agreeable than warm water.

Skin, dropsy, and *kidney.*—For further prophylaxis and treatment, see p. 386. The risk of supervention of dropsy is certainly lessened by keeping the child in bed, thereby preventing chill and avoiding excessive work of the excretory organs. Hot fomentations or spongiopiline placed across the loins in the beginning of renal complications. Hot air baths (p. 387) and hot water baths (p. 497) are useful.

Nitrate of pilocarpin gr. $\frac{1}{10}$ internally or hypodermically to induce sweating either in uræmia or for a simple hot and

dry skin. Children bear it well, but the heart and pu
should be narrowly watched.

The urine must be tested night and morning during
whole course of the fever. Extensive dropsy may occur
disappear without albuminuria. Some hold that quinine
vents the nephritis by its action on the protoplasm
Bowman's capsule. This I regard as very problemati
Waring regards chlorates as very serviceable in dr
following the fever.

Dilute acetic acid given internally is said to prevent dro
but experience does not support this statement.

Blisters have been applied to the legs in scarlatinal dr
and opened; but are not recommended owing to the can
rides and to the difficulty of getting the ulcers to heal.
gation with salines should be brisk.

Juniper or gin is given by some for scarlatinal dropsy.
may be cautiously prescribed in half dram doses of the sp
freely diluted, for a child of seven.

Treatment during convalescence.—Iron and gentia
excellent bitter tonics for the completion of convalescen
promoting appetite, digestion, and blood making.

℞ Ferri Sulphat., gr. iii.
Glycerin, ℥xx.
Syr. Limonis, ℥xx.
Inf. Calumbæ, ʒii.

in water, three times a day before meals, is a pal
prescription.

Change of air and scene, but with the most rigorou
tection from cold and damp soil and winds, is of
benefit in the finishing up of the case after all signs of
quamation have disappeared. Torquay, Bournemouth,
zance are usually mild and suitable climates when
places are too cold. Sea air is not suitable for album
as a rule. Dry inland resorts are preferred in these

Arsenic in two-minim doses, with dilute nitric acid ♏v., may be given, but not during the fever (Ringer). Persistence of the strawberry tongue is a special indication for its use.

ENTERIC FEVER.

There is no anatomical or physiological reason why children should not have typhoid fever in a severe form, and yet the disease is rarely fatal. It is true that boys between the ages of six and twelve are said to be the most frequent subjects of the fever. Generally speaking the patients come of a healthy stock, and have a good previous history. But I think the general consideration that growing organisms more successfully combat diseases of a gradual course, and more readily recover from such gradually developing fevers, may partially explain the low rate of mortality of typhoid fever in children. The diagnosis of the disease naturally presents some difficulty at the outset and during the course of the disease. The practitioner has to bear in mind gastro-enteric catarrh, often accompanied by typical remittent fever; pyæmia from ulcerative endocarditis and multiple periostitis; acute tuberculosis; tubercular meningitis; tubercular peritonitis; tubercular and simple ulceration of the bowels.

As the duration and degree of severity of typhoid fever varies in different epidemics and in different individuals in the same epidemic, it is not surprising nor difficult to understand that gastro-enteric catarrhs or inflammations may be confounded with the milder attacks of enteric fever.

Pyrexia in infancy is prone to be markedly remittent.

In typhoid fever of some degree the diagnosis seldom remains long in the balance. The dry heat of the skin, enlargement of the spleen, bronchial catarrh, tympanites, rose spots which are usually less abundant in children, irregularity of the bowels, continued fever with morning remissions, are all present at the end of the first week of illness.

Vomiting at the outset is a more frequent symptom in children, and so is epistaxis. The cerebral symptoms may be very decided even a day or two after the beginning; these are delirium with a great tendency to stupor. The deep coma as of meningeal inflammation is very seldom witnessed in typhoid fever. The pyrexia of marked enteric fever is almost always higher than that of acute tuberculosis. Constipation with a flat belly and with some head symptoms points to meningitis. If there be optic neuritis, or tubercle in the choroid, meningitis must be diagnosed. Constipation with a distended belly, and with muscular tremors, is not an unfrequent combination in typhoid fever. In a doubtful case a large spleen is no guide, for tubercle in the spleen may be attended with considerable enlargement of that organ. I have known persisting internal squint to come on in an attack which turned out to be simple gastro-enteric catarrh in a girl aged four. This puzzled the doctor at first, but the subsidence of all symptoms, except the squint, and the detection of considerable hypermetropia explained matters.

Simple inflammations of the alimentary tract are not attended with enlargement of the spleen. The clinical course of tubercular or simple ulceration of bowel, or of tubercular peritonitis, is far less definite, and more straggling than that of a moderate degree of enteric fever, of which high and continued fever is a marked feature. The period of incubation of typhoid fever is rather long (two to three weeks), it comes in the same category as measles, hooping cough, chicken pox.

Cases of enteric fever are treated in the general wards of a hospital with but little risk of infection.

Abundance of fresh air, careful personal hygiene on the part of the doctor and nurse—washing the hands, keeping the clothes from coming in contact with the patients,

especially when removing stools—disinfection of the stools, are important preventive measures.

If the child be ailing with fever he must be put to bed, but he may get up part of the day, if the fever subside considerably, as it may do during the first days of typhoid.

Treatment.—*Constipation.*—A teaspoonful of castor oil, or half a one for a small child, may be given occasionally during the first few days of the illness. Afterwards it is best to relieve the bowel by a few ounces of warm soap and water.

Diarrhœa is not to be treated if only three stools a day, unless they are pea-soupy stools and very offensive, which usually means excess of mucus, and indicates, I believe, a greater affection of the large bowel. A grain of Hyd. c. Cret. and one of Dover's powder often removes this offensiveness and improves the patient's condition. Profuse diarrhœa is best treated with Bism. Trisnit. gr. xv., Mucilag. Trag. ℥xxx., Chlorodyne ℥ii. every three hours. A thin starch enema, ʒss. with ten drops of laudanum, may be thrown into the rectum. These doses for a boy six years old.

The diet will require attention. Milk should be withheld, or very weak condensed milk may be used instead (ʒi. to ʒvi.). Chicken broth is often more suitable than beef or veal tea.

The dose given should be very small. It should be cool also. If necessary, some gruel or milk may be predigested and most carefully strained of any solid parts. Our object is to obtain absorption from the stomach and duodenum; not to give enough to increase the diarrhœa.

Logwood extract with chalk mixture may succeed where bismuth and opium fail. (For other prescriptions see article on Diarrhœas.)

Antiseptics are vaunted by some—borax, terebene, sulphocarbolates, turpentine. Epistaxis at the outset of the disease rarely needs attention.

Thirst is sometimes troublesome. Simple boiled filtered iced water in two teaspoonful doses at a time is better than much acidulated drink whilst febrile movement goes on.

Antipyrexis is effected by the usual measures (see p. 486). A tepid water bed, with or without a stream of water running through, can be managed without much trouble. Tepid or cold sponging is easily carried out. Any temperature above 103° should be treated.

It does not follow because the growing organism recovers rapidly from the effects of pyrexia that it should be submitted to the action of high temperature any longer than is necessary.

Quinine gr. i.-v., antipyrin gr. v., salicin gr. v., have been given as in scarlet fever (see p. 498).

Sleeplessness, restlessness, and excitement are sometimes marked during the early stage, and should be combated by the employment of cold to the head. If the patient will permit it, an ice bag, or Thornton's cap. The head should be shaved in severe cases. Perhaps a few leeches behind the ears might be useful if cold did not succeed. A few drops (3-5) of chlorodyne, or Dover's powder gr. v., for a boy of six, may relieve simple insomnia.

Coma rapidly setting in is due to a further degree of action of the same cause that gives rise to excitement, and ought to be treated by the same means.

Continued shrieking at the close of the fever, or after it, brings to the mind the possibility of *otitis*, but some convalescents from typhoid are often noisy and shout a great deal—probably from mental impairment.

Mental obtuseness and slow recovery of faculties often noted after typhoid fever calls for no treatment beyond watching and waiting, unexciting amusement, fresh air, especially from the sea, and judicious nourishment with a little good beer or wine.

Parotitis is not very unfrequent. Repeated hot fomentations under oil-silk, with glycerine and belladonna to the skin, with good nourishment and stimulants are valuable. Abscesses must be opened early.

Subperiosteal and other **abscesses** are seen at times towards the end of and after the fever in children. They require the ordinary antiseptic surgical treatment, as soon as discovered. They may cause but few symptoms.

Gangrene of mouth or **necrosis of hard palate** may occur. The sloughs separate slowly. They are by no means necessarily fatal. The parts should be kept sweet by syringing with chlorine water or weak Condy's fluid. Frequent gargling is good, and will prevent over-contamination of the inspired air. Iodoform should be blown from an insufflator on to the surface of the slough. Iodol is good.

Sometimes **pleurisy, pneumonia,** and **bronchitis** develop, and require attention. Hot fomentations, or a light muslin-protected mustard-plaister may be put on for five or ten minutes over the heart. Therapeutically, these inflammations require more stimulants. If cerebral symptoms coexist, the wet pack is invaluable. Bronchitis appears occasionally to be increased as the result of too free administration of nourishment and stimulants.

Perforation of intestine and peritonitis may occur in children, and often proves fatal. Perfect rest, with protection of the abdomen; opium, in sufficient doses of the pure powder, commencing, say, with gr. $\frac{1}{4}$; hot fomentations to the belly and frequent small doses of cold drinks of whey, barley water, broths and stimulants in proportion to the demands of the pulse and heart and nervous system, constitute the treatment. Hæmorrhage from bowels is rare. The great principle is to keep the patient and the bowels quiet, and opium usually does both.

Opiates, either pure powder gr. $\frac{1}{4}$ at once, or chlorodyne

mv. for a boy aged six. Gallic acid gr. v. in syrup mxx. Aq. ʒii. is not of much value.

Perchloride or pernitrate of iron in ten-minim doses, acetate of lead in two-grain doses with opiates, turpentine in ten-minim doses, have been tried. Ergotine in two-grain doses may be injected under the skin, or half a dram of the liquid extract may be given with mucilage and syrup by the mouth.

Excessive tympanites is of grave import; it impedes cardiac action, and is a call for stimulants. Half-an-ounce of starch enema and ʒss. of turpentine may be injected into the rectum. Terebene is even better. Assafœtida is used. These are also given internally in five-minim doses, with mucilage, syrup, honey, or glycerine, and some aromatic water. A dry tongue with nervous prostration and muscular tremors is not better treated by turpentine than by good brandy and careful feeding.

Laryngeal ulceration is not common in children; it varies in different epidemics.

Diphtheritic membrane may form in the larynx. For treatment see separate sections.

But the treatment of these symptoms and complications is of trifling importance compared with the necessity for the **treatment of the patient.** Absolute rest for mind and body, so as not to waste the energy, on the one hand, and careful diet and stimulation, so as to restore and eke out the energy to the best possible advantage, on the other, are the commandments for the treatment of typhoid fever. Undiluted milk ought never to be given to children suffering from enteric fever. It is of imperative importance to secure fine divison of the curd. I am not sure that I do not prefer the use of condensed milk for typhoid fever, though some fresh food must be given. Whey, made in the ordinary fashion, or by boiling milk

with a little lemon juice may prove of great value when the stools contain much curd, and the child has "stomach-ache," whether in or after the fever. Barley water and milk in equal parts is good. Mellin's food with water and thin milk also. Vegetable broth made from a hodge-podge of barley, carrots, potatoes, peas, &c., and carefully strained, is a great change after the veal and mutton broths, beef tea and chicken tea. Indeed, if the diarrhœa be abundant, it should be preferred to them. It is absurd to suppose, however, that animal broths always promote diarrhœa. Food must be given "little and often." When the patient is really ill, write out in cut-and-dried fashion the quantity of broth, beef tea, &c., and stimulants to be given, and put the hour also at which each is to be administered. [Brieger finds that cultivation of the typhoid bacillus in beef-tea produces a powerfully poisonous alkaloid; Brunton, thereupon suggests the avoidance of beef-tea and such (?) albuminous diet.] This chart may require alterations, but the "cut and dried" statement is, nevertheless, the correct thing. The indications for stimulants and the signs that they are doing good are not different in typhoid fever to those in any other febrile illness. The dry glazed tongue, small, dicrotous, or thready pulse, feeble first sound of heart (it is interesting to watch the first sound of the heart become gradually altered during the course of the fever) or much sweating, require brandy or wine. The pulse may be infrequent in typhoid when the temperature is high (see Scarlet Fever).

In returning to ordinary diet, it is highly necessary to proceed cautiously. For any solid food may bring back the fever and increase the ulceration, which should be healing. Many cases of "after" fever are due to this feeding too quickly. Others are doubtless due to relapses. The constipation, often troublesome after typhoid fever, should be

treated *a posteriori* by soap and water, with a little castor oil or olive oil. Purgatives per os should be avoided for some time. Liq. Ext. Cascara Sagrada after a few weeks have elapsed is useful, ɱxv. t.d.s. for a child of five. Pastiles of these are not disagreeable to take (Martindale). Duncan and Flockhart have introduced capsules of the same. The low temperature of the body frequently seen after typhoid is probably an indication that ascending metabolism is greater than descending; it is not a bad sign in itself, and merely calls for careful clothing and feeding. This low temperature is seen after many fevers, but more after enteric, in my experience.

The value of abundance of fresh cold air in typhoid fever seems to be strengthened by the recent successful treatment of the fever by inhalations of artificially cooled air.

Typhoid state.—Usually treated by feeding and stimulants. Caffeine in one-grain doses, or digitalis in three-minim doses, may remove cardiac dilatation and promote diuresis. The doses for a child of seven. It has been proposed to employ benzoic acid and salicylic acid in the treatment of typhoid conditions. These substances, and such as toluene, zylene, toluic acid, ethyl and propyl benzine, which are transformed into benzoic acid in the organism, are supposed to dissolve and carry out of the system the imperfectly oxidized bodies resulting from the disintegration of tissues and foods. The dose should be three grains three times a day for a child five years old. It may be increased according to circumstances. Benzoic acid, as less liable to weaken the heart, is preferable. Benzoate of soda is considered preferable by some (gr. iii.), and is somewhat antipyretic also.

MUMPS.

A simple case of mumps presents no difficulty in diagnosis and requires but little treatment. The patient should be isolated. It takes two or three weeks before it is known

whether others who have been in contact with the patient will show the disease. Social intercourse should not be allowed until two weeks after the first appearance of the glandular swelling.

The bowels always require a simple purge of liquorice powder ʒi., or Gregory's powder gr. x., in gelatine capsule, for a child four years of age. Mumps is rarely seen before this time of life. The fever is apt to be severe, and may require tepid sponging or wet packing. Occasionally severe constitutional disturbance and high fever herald the approach of metastatic inflammation in the testicle or mamma. This is not so frequent as in adults. Sometimes the constitutional symptoms come, but not the orchitis. And delirium or convulsions may open the case.

The patient must be kept in bed during the fever, which lasts about a week, and be confined to one room for a week afterwards. Deglutition, mastication, and articulation are to be avoided as much as possible, and a liquid or soft diet is required—broths and jellies. As a rule the salivary secretion requires no consideration; it is occasionally profuse, but not then offensive, unless the bowels are loaded, and the tongue furred, when a simple purge is indicated.

The parotid or submaxillary swellings should be fomented with boracic lint or clean flannels under oil silk, but the skin should be painted first with glycerine of belladonna (extract, glycerine, water, of each two drams). The fomentations should be repeatedly renewed. This treatment gives great relief to the aching sensation.

The third of a grain of grey powder given three or four times a day is said by Ringer to relieve pain and swelling. But the pain has a tendency to abate of itself.

The testicle in boys (orchitis) may require the same fomentations. Any complaint of the part should be followed by local applications, a saline purge and rest in bed. Aconite

is used by some. Some prefer warm wet compresses of lint or hot spongiopiline. Instead of the belladonna paint, chloroform, turpentine or tincture of belladonna and opium have been used. If local measures relieve not the pain, an opiate may be given internally. Dover's powder 5 grains, or chlorodyne 5 minims, for a child five years old.

Fever may be treated by the usual bath and sponge methods and by drinking plenty of bland fluids: bitartrate imperial ʒi. to Oi. of cinnamon water, or half-a-dram each of nitrate and bitartrate of potash in thin barley water flavoured with lemon, promotes diaphoresis, diuresis and peristalsis.

Tincture of aconite in half-drop doses frequently repeated, has been used in drop doses. It is valuable when the fever is high and the skin and mouth dry.

Convulsions and delirium ought to be treated by a hot mustard bath, with cold water poured over the head, and by free purgation with compound jalap powder ʒi., or elaterin gr. $\frac{1}{20}$, for a boy six years old.

Specifics to cut short the disease.—Jaborandi infusion, or nitrate of pilocarpin under the skin, are said to arrest mumps. But they must be given at the onset. Twenty-drop doses of the infusion, or $\frac{1}{16}$ grain of the hypodermic preparation, is the dose for a boy of five. The effects require watching. Children stand these drugs well as a rule. But occasionally cardiac depression is said to come on.

Deafness may be cured by Politzer's bag, air being forcibly blown into the nostril whilst the child swallows, or even without its swallowing. The mouth and other nostril should be shut. Or the child, if old enough, may be taught to do a Valsalva experiment and inflate its own tympanum.

Occasionally permanent deafness occurs, and may be treated by iodide of potassium, but seldom successfully; it may be due to disease of the auditory nerve or of the internal ear. Positive brain lesions may occur in mumps and be ushered

in by convulsions and delirium, which symptoms may, as we have seen, occur independently of actual organic cerebral change. The lesion is usually vascular, and hemiplegia or epilepsy may be the clinical manifestation.

DIPHTHERIA.

Diphtheria is a powerful destroyer of nervous energy. Asthenia is the danger in it, and certainly not less important than spread of the disease to the larynx—an event that usually happens within a week of the appearance of the throat disease. The most malignant form of diphtheria, though a toxæmia, has no relation whatever to septicæmia (putrefaction). In this form the little patient rapidly becomes profoundly prostrated, with a low temperature and feeble, perhaps very slow, action of the heart, shown in the blueness and coldness, with other signs of collapse and nervous depression. Here the patient may die, without the faintest attempt at rallying.

When this asthenic state results from septicæmia, it usually occurs later in the course of the disease, and is attended with symptoms indicative of the typhoid state. It is frequently febrile, and is less rapidly fatal than the most malignant variety. Now, there are all shades of these two serious varieties, from one end of the scale to the other, where the symptoms are comparatively slight.

The incubation of diphtheria is effected in four to six days; it will suffice for the practitioner to remember that the disease is one of those with a short period of incubation, like scarlet fever and typhus.

The *diagnosis* has to be made chiefly from tonsillitis and scarlet fever. The fever of scarlet fever and tonsillitis is usually of rapid onset, and reaches its height (103-104 frequently) in a few hours. The rise of fever in diphtheria is slower altogether, and there is rather a tendency to a low

febrile temperature, and yet to a far greater sense of illness than attends tonsillitis q.v. The spots of follicular stuff in quinsy seldom form a continuous lamina. The glands at the angles of the jaw do not become hard and large as in diphtheria, and albuminuria is generally absent. Hoarseness, or any alteration of the cry or voice, points to the involvement of the larynx, and mostly by a membranous exudation.

The *nasal*, or rather nasopharyngeal, form of diphtheria is frequently fatal in children, without there being any membrane visible by direct inspection from the mouth. Severe illness, with vomiting and an ichorous discharge from the nose, and sometimes otorrhœa, are the chief signs of this variety. The membrane may be seen by inspecting the anterior nares; posterior rhinoscopy is not very practicable in young children, owing to the smallness of the parts and to the inability of children to give assistance. The forefinger, however, may be passed behind the soft palate, and valuable indications may often thus be afforded.

The causation of the **paralysis** and other **nervous sequelæ** of paralysis has never been explained. But I think sufficient attention has not been given to the nervous depression, which is a feature of the attack of diphtheria itself. I am perfectly certain also that many deaths in diphtheria, and especially those in which vomiting and irregular, slow pulse are features of the clinical course, are literally cases of diphtheritic palsy occurring *in* the disease. The explanation of the interval, or period of incubation, which elapses before the development of the paralysis is very difficult. Whether there is a second "brewing" of the poison, or whether the ascending neuritis is creeping up to the cord, or whether the nervous system after diphtheria is merely predisposed to the paralysis and some exciting cause, as overexertion, bad feeding, wet and cold are necessary for its development, we cannot say. The interval is not a fixed

period—it varies in different cases, but not without some reason. Sir W. Jenner has said that the symptoms of fatal cases of diphtheritic paralysis always begin before a few weeks have passed by; my own investigations support this view. Bernhardt's statement that half of the cases of diphtheria lose the knee-jerk whether they have paralysis or not must be further corroborated. I am disposed from personal observation to think the statement is correct.

I have watched the mode of disappearance of the knee-jerk in several children convalescent from diphtheria. Its final extinction is frequently attended with an exaggeration of the phenomenon. In one case a tap on the one side not only caused the triceps of that side to contract well, but there was also an apparently simultaneous contraction of the other triceps extensor. A day later the knee-jerks could not be obtained on either side. It seems, then, as though the extinction of the knee-jerk, like the final spontaneous extinction of the wick of a candle, is attended with a flickering or irritable manifestation of weakness. The "lightening" that often occurs just before death comes to my mind in this connection. See the arguments also in my papers on chorea.

Paralysis of the soft palate (regurgitation of fluid through nose and nasal voice), of the ocular muscles of accommodation (inability to thread needle), of the external rectus (convergent squint), and weakness of the masseters and internal pterygoids (mouth wide open), are the most common motor phenomena (including loss of knee-jerk) of diphtheritic palsy. Weakness of legs and arms, trunk and neck muscles are also frequent. Sometimes there is more inco-ordination of movement than weakness.

The sensory phenomena are also marked. There are spontaneous sensations of numbness and tingling generally in the paralysed parts, and also anæsthesia. The sensory nerves of muscles appear to be disordered in function also, to

various degrees: as manifested in the sensations of weight and heaviness, or, at times, of lightness ("limb feels as light as a feather"), as well also in the ataxia of gait, which cannot always be ascribed to muscular weakness or motor inco-ordiation.

The vacant stare of these paralytics is partly due to the open mouth, but also, doubtless, to a vaso-motor spasm and atony of the facial muscles. There may be sensory disorders of vision (both for acuity, field, and colour), and also of hearing. Taste and olfactory perversions are less noted.

When I say that in six years I have made post-mortem examinations on twelve cases of death from diphtheritic palsy, the reader of this book will not be led away by the usual statement that diphtheritic palsy usually terminates in recovery. As to the percentage of recoveries in children, we have no information, but of its frequent fatality the practitioner should be aware. Slight cases, in which the ocular and palatal paralysis and anæsthesia are the only symptoms, may be very frequent, but the general physician is seldom consulted for such symptoms alone.

As to the seat of the lesion causing the paralysis, it may be in the ganglion cells of the anterior horns of the cord, or it may be in the peripheral nerves, and some think it is in the nerve cells that intervene between the spinal motors and the highest cerebral motors. In some cases a diminution in reaction to faradism clearly shows that the lower motor segment is affected (nerve or cord). It may be a slow subacute myelitis or neuritis. I would suggest that slight changes in nerve or cord sufficient to cause weakness need not lessen the faradic or alter the galvanic reactions of the weak muscles.

Preventive treatment.—The case should be isolated, as being of a contagious nature.

The sanitary conditions of the dwelling and its neighbourhood should be inquired into. The air, water, milk and

other hygienic surroundings should be carefully inspected for the cause. Emanations from manure heaps, and dust from the demolition of old houses, are given as causes, and should certainly be avoided.

The actual **treatment** of diphtheria consists in three things at least.

(1) Combating the acute neurasthenia.

(2) Most sedulous attention to the local seat of disease.

(3) Feeding, which is included under the first, but requires a special mention.

The throat, nose, larynx, bronchi, wounds, and rarely œsophagus, may be local seats of the disease.

Whether these local seats are entrances or exits of the diphtheritic poison I know not; but I am thoroughly convinced of the necessity for topical applications carried out as rigorously as possible.

For an exposition of the importance of local treatment based on the germ theory, and for an advocacy of early tracheotomy as a means of preventing the spread of membrane to the trachea, read a paper by Watson Cheyne in the "British Medical Journal," p. 504, 1887.

Let me take the first and third things together.

The administration of nourishment should be carried out on the "little and often" principle. Beef tea and meat essences are most useful, but chiefly as stimulants. Indeed, in severe cases but little food can be digested, and the battle is to eke out the victim's vitality by carefully conducted, even sedulous stimulation.

In these cases the food may be predigested. Brandy, champagne, port wine, jelly, and all the resources should be called into requisition. Vomiting may be managed in the manner mentioned on p. 319. Feeding by rectal enemata or peptone suppositories (Savory and Moore) should be supplemented by the nasal-gastric catheter. It is a great

mistake to suppose that the naso-gastric alimentatio
difficult. The child must be put to bed in a tent, w
should, however, be ventilated by a hole at the top.
bronchitis kettle or steam spray, with 1 in 20 carbolic
should be arranged so that the tental atmosphere is
moist and warm, and as far as possible aseptic. The
must not be distressed any more than must be, for the stre
is to be strictly husbanded. Sleep should be secure
absence of noise, and by bromides gr. v., or chloral gr
guarded with stimulants of liq. ammonia ɱx. or brandy

Cold wet compresses are used to the skin of the th
and frequently changed so as to keep down the glan
swelling. Hot boracic acid fomentations under oil sil
preferred by some.

Bronchitis and broncho-pneumonia and pneumonia s
be treated by free stimulation, hot fomentations, light
linseed poultices, and an occasional mustard plaister ca
guarded. These complications may arise apart from t
otomy.

Hæmorrhages from the nose, in the urine, from the
and into the skin (purpura) call loudly for stimulatio
the danger is not even then usually averted.

Of the indications for tracheotomy I have else
written (p. 158). The management of cases of tracheot
conducted on the general principles of removing all ob
tion to the breathing, of keeping the wound and sec
sweet, of not meddling with the trachea more than is nec
of removing the tube as often, and as soon, and for as
time as possible—regarding it, in fact, as a necessary *bê*
—and, finally, of supporting the patient. For the de
surgical management I cannot do better than reco
the 2nd Edition of Mr. R. W. Parker's work on "
otomy."

Iron and quinine is the best medicine for combating the neurasthenia and anæmia.

℞ Tinct. Ferri Perchlor., ♏v.
Quinæ Sulph., gr. i.
Glycerini, ♏xx.
Aquæ, ʒii.

for a child of five. Some prescribe much larger doses of iron alone.

This is what I have found most useful. The treatment of diphtheritic **paralysis** must be carried out on definite notions concerning its danger. Any degree of it that attracts attention should be treated by rest in bed at least for a week or so in a room kept at a temperature of 65°, with the cot away from draughts. These regulations are most necessary if the palsy has come on within two weeks of the local diphtheritic lesion.

The danger threatens from three quarters at least: (1) paralysis of larynx; (2) of the diaphragm and other respiratory muscles; (3) of the heart.

(Sudden death *in* diphtheria is ascribed to this paralysis, to simple vagal inhibition, to "myocarditis," and to formation of clots within the dilated ventricles.)

An ineffectual cough is an important sign of laryngeal palsy. The belly sinks in during inspiration when the diaphragm is paralysed; it is, of course, the chief respiratory muscle in young children. Paralysis of the muscles of deglutition should be treated by feeding the patient with the naso-gastric tube passed into the stomach from the nose. The rectum may also be employed as a place of feeding, though it is more intolerant of interference in children than adults.

Albuminuria is not often of high degree in diphtheria, but sometimes the patient dies of uræmia, and rather suddenly, too, in the course of the disease. In such cases I have found

a very large white kidney, the capsule being distended. There has not been much interstitial change. In two cases of the kind the urine was so albuminous as to almost solidify the whole portion boiled. Chronic renal disease sometimes starts from a diphtheria, but some of the cases quoted of this kind may have been scarlatinal membranous sore throats. (For treatment of Uræmia see p. 387).

When the child is completely convalescent from the diphtheria, or its nervous sequelæ, or if the latter be slight, a change to the country with as much fresh air during the day as possible is beneficial; but cold, damp, and fatigue should be regarded as envious enemies that may educe palsy which would otherwise have been tided over. Cod-liver oil and steel wine may be given alone or in combination (see directions on p. 65).

Massage (p. 473) and galvanism (p. 475) are of some service in promoting the return of power to the muscles. Electricity may also be tried in cases of diphtheritic palsy of the diaphragm and heart, the positive pole being placed at the nape of the neck and the negative stroked about the epigastrium and along the course of the vagi. The faradic shock may be tried in cases of cardiac syncope.

The *drug treatment* of diphtheritic paralysis counts for something. Belladonna tincture, ℥x. or more t.d.s., freely pushed is the most useful, but its effects should be carefully watched. Liq. Arsenic ℥ii., quinine gr. i., liq. strychniæ ℥ii. t.d.s, are also useful doses for a child of five. The belladonna has apparently assisted largely in the cure of desperate cases, as I can testify myself.

Last, but not least, I come to **topical** applications to the diphtheritic lesion. Their number is legion. Every practitioner has his own agencies. I may give my own first.

(1) Spray of sanitas frequently used.

(2) Gargle of chlorate of potash or chlorine water, also frequently used if the child be old enough.

(3) Iodoform in fine powder blown on to the diseased surface.

My principles are the greatest possible cleanliness by the removal of all mucus and septic materials; the removal of membrane if it can be easily detached; antisepsis by iodoform. Mopping the throat out assiduously with a sponge fixed on a holder is good if the child cannot clear out its own throat. Discharges ought to be removed as soon as possible to prevent absorption of septic matter by circulation, lymphatics, or air passages. It will be seen that I do not advise escharotics, nor tearing away firm membranes, nor antærics, nor special solvents of the membrane. Doubts have been thrown of late on the *antiseptic* property of iodoform. I shall reconsider, not necessarily alter, my position after reading the paper of Watson Cheyne.

I shall arrange the vast mass of methods of treatment under the heads indicated below. They may be used to the nose as well as to other parts.

I.—Severe, not to say violent local measures: Escharotics, sharp spooning, galvano-cautery. The galvano-cautery has been applied to the patch with the object of causing it to slough away. Dr. Bloebaum, of Coblenz, has used a special apparatus, which may be inspected at Messrs. Buehl, 75, Coleman Street, E.C.

Dr. Nix, of Rude, employs the sharp spoon, scraping away all the membrane, and even the subjacent softened and infiltrated parts, and then cauterizing the bare surface freely with solid nitrate of silver.

Escharotics to destroy the deposit, including the germs, and so to stay the spread of the deposit. Solid nitrate of silver stick, or strong solution gr. xx. to ʒi. of distilled water; equal parts of hydrochloric acid and honey; nitric acid and honey equal parts. These are applied with a camel's-hair brush or with a mop of small sponge mounted on whale-

bone or held in a sponge holder. One application at outset is the usual recommendation.

II.—Astringents used with the same object as escharot but they are less radical. Some recommend these not to repeated: Equal parts of glycerine and liq. ferri per fortior. put on the patch of membrane with a camel's-h brush in the early stage of the case. Glycerine of tar and of carbolic acid; nitrate of silver gr. x. to ʒi.—brush spray; tincture of iodine to the ulceration.

Powder of salicylic acid applied by insufflator or fin This may be combined with moppings of four-per-c solution of cocaine.

III.—Antærics, usually varnishes, to keep away the air oxygen, as in ringworm to prevent the growth of organism on which the diphtheria is supposed to depend.

Morell Mackenzie advises a solution of solid tolu balsar ether; the part should be dried with blotting paper, and tolu painted on the patch of membrane and on a ma around each patch. Other remedies are used also. hoped by this means to prevent the spread to the lar Traumaticine (gutta percha dissolved in chloroform 1 to has been advocated also.

IV.—Solvents to dissolve the membrane off. Th certainly unobjectionable treatment. They are m applied by means of hand or steam (Seigle's) sprays. gargles and brushes may be employed.

Lactic acid sp. gr. 1·312 (Martindale's), may be ap with the brush undiluted. Or ʒi. to ʒii. of water ma sprayed on to the membrane.

Spray of lime water, spray of five-per-cent. soluti tannin.

Solutions of vegetable ferment papayotin (from p juice) painted on with a brush at frequent intervals; a solvent by fermentation, but is costly and ineffe

Inhalation by atomiser of trypsin; to be used frequently; the liquor pancreaticus (Benger) is usually handy; a dram to the ʒi. may be sprayed from a Seigle (Lewis Smith speaks highly of it). Fairchild's trypsin may be used.

V.—Antiseptics and germicides to prevent putrefraction promote cleanliness and the removal of membrane are certainly valuable. Gargles, sprays, insufflations, or direct applications by the finger or sponge or mop. Warm in preference to cold gargles are to be recommended as likely to be more active.

Gargles of solution of chlorine (P.B.) and solution of chlorinated soda (B.P.)

„ of quinine ʒi. to ʒi., or stronger; it may be sprayed.

„ of Condy's fluid 1 part in 10.

„ of tincture of capsicum ʒi. to ʒx.

„ of liquor sulphurosi acidi, diluted 1 in 5 or 10.

„ of corrosive sublimate 1 in 1000 or 1 in 500 with glycerine or it may be sprayed.

Inhalations of iodine (vapour cone of North Hants Chemical Company).

„ of solution of sulphurous acid, also spray.

„ of alkalis (sodic carbonate), persistently used to prevent spread to larynx, used when the least huskiness is observed (Lewis Smith). Trypsin as much as can be suspended in the following:—

℞ Sod. Bicarb., ʒii.
Aq. Calcis, ʒvi.

Swabbing with "boroglyceride" (Barff's).

„ with helenin (Obiol), which dissolves in the proportion of two per cent. in oil of almonds. The patch is first powdered (finger) with camphor, then the oil painted on; every four hours.

VI.—**Internal remedies.**—*Emetics* valuable sometime the outset. Mustard ʒi. to ʒi. of warm water (children var the amount of mustard required) is the best. It dimini spasm of larynx and empties trachea of much of its conte Ipecac. wine ʒi. repeated every ten minutes till effective i pressing but efficacious in simple spasm. Sulphate of (ʒss.) or sulphate of copper gr. i. *repeated every ten mi* till effective (child six years old).

To detach membrane by promoting secretion in the pharyn Infusion of jaborandi ʒss. t.d.s., or $\frac{1}{30}$ grain of pilocar hypodermically for a child two years old. Tinct. Actæ Ra ɱv., in Spt. Am. Arom. ɱv., Glyc. ɱxx., Aq. ʒii., f child two years old.

Antiseptics.—Tincture of iodine one or two minims in s of orange or quince. Helenin one grain t.d.s. for a chil years old after the local application. The drug is constipa

Corrosive sublimate gr. $\frac{1}{100}$ with or without perchlori iron and glycerine. Its continuance is to be gauged b condition of the false membrane; more to be given i membrane spread, and *vice versâ*. Great care shoul exercised in using this valuable antiseptic.

Alteratives (*?*).—Prophylactic and specific.

1. Chloride of gold gr. $\frac{1}{60}$ every hour; child two years requires watching. It is on its trial.

2. Bicarbonate of potash gr. iii. every four hours; two years old; the skin to be first thoroughly cleaned by bath in which plenty of bicarbonate of soda is dissolved is of doubtful efficacy.

3. Benzoate of soda in two-grain doses, and gr (separately) of sulphide of calcium in pillule or syrup; inhalations by atomiser of ten-per-cent. solution of ben of soda. Free stimulation and feeding. Reduction of by quinine, aconitine, or antipyrin. Probably of no sp value. (O. Brondel's method.)

4. R Liq. Ferri Dialysat., ʒss.
Glyc. Acid. Carbolici, ʒss. (P.B.)
Glycerini pur. ʒiss.
Syrupi, ʒiss.
Aquam, ad ʒii. ʒi.

every two hours for eight days at least (John Irving).

Antiphlogistics: Depressants of heart, circulation, and nervous system with a view *to relieve spasm and promote detachment of membrane and to cut short the disease.*—*Antimony* wine five minims every hour. Good in simple laryngitis and at the outset perhaps of diphtheria, but exhausting and prostrating. It should not interfere with the call for tracheotomy.

Calomel gr. ½ every hour and mercury ointment rubbed into abdomen. Recommended in "sthenic" forms. Venæsection (four ounces) from arm or jugular vein. None of these measures are to be recommended. Sthenic forms are of questionable existence.

HOOPING COUGH.

Hooping cough is a contagious and infectious chronic specific fever, attended with severe nervous disturbance and mental distress, paroxysms of coughing, with laryngeal spasm, frequent bronchitis, vomiting after the cough, and epistaxis. Ulcers under the tongue, about the frænum, are common, but I have never seen this ulceration in hooping cough unless the child had teeth in the lower jaw (see Syphilis, p. 79). Sometimes hæmorrhages take place from any mucous surface. Extravasation of blood under the conjunctiva is of frequent occurrence. Occasionally blood is extravasated into the brain. Hemiplegia and monoplegia are known to occur in association with hooping cough. These are attributed to thrombosis of veins, but I think a hæmorrhage would explain them equally as well, and in fact

better, if the child becomes paralysed without being sever ill from the disease. Hæmorrhage from the external audit meatus is said always to point to rupture of the tympa membrane.

There is a great discharge of glairy mucus from trachea. This is not unfrequently ejected from the phary doubtless not from the act of hawking, but rather m mechanically; or the vomiting may cause its expecto tion.

Dr. Eustace Smith believes that there is also an exces secretion of mucus from the stomach and intestine " mucous disease."

Children with hooping cough do vomit and pass mu from the bowel, and are ill with it. Doubtless there a sympathy between all the mucous membranes of the b so that one is not diseased without the others suffering; this is more evident in children than adults.

Laryngismus stridulus is mistaken for hooping cough, the hoop of the latter complaint only succeeds to a fi coughing, whereas it is the initial disturbance in laryngis The two diseases are said to complicate one another o sionally. This is a little unnecessary. Laryngismus is liable to occur whenever there is any abnormality of the ch larynx. Even in the very early stage the catarrh of pertus more severe, and attended with a more spasmodic cough that of simple catarrh. The bronchial and pulmonary cor cations are very important—bronchitis, broncho-pneum collapse, vesicular and subcutaneous emphysema. Ple is occasionally present, but rarely without pneumonia in experience. Phthisis and acute tuberculosis are freq sequelæ in the scrofulous, and indeed when there is no cation of this diathesis. Rickets makes the prognos hooping cough bad, owing to the impaired powers of res tion and to the general debility associated with it.

Tubercular meningitis is occasionally developed at the close of hooping cough. Herniæ frequently first come down. The various thoracic deformities may often be traced to hooping cough, especially the true pigeon breast. And the true rickety thorax is often modified by this complaint.

The organism after hooping cough is left in a peculiar state for some time (as in ague, but to a less degree), for a mere catarrh has often the characters of hooping cough imparted to it, even months after the subsidence of the complaint. These can hardly be explained as relapses.

Hooping cough is one of those fevers with a short incubabation period, like scarlet fever, diphtheria, &c. The infection lasts about six weeks, and the complaint itself about two months. These are average statements.

The **treatment** of hooping cough will almost necessarily be of the *expectant* kind, but we should try everything. A healthy child usually requires but little treatment. The fresh air in autumn, or when the weather is not too cold nor wet, is better than close confinement, provided there be no noteworthy loss of strength and no pulmonary complications. A little sibilant rhonchus need not keep the child indoors except in bad weather. In the spring and autumn, when the disease is most rife, the *clothing* of the child is important. The body must be warmly clad with woollen or flannel raiment all over its surface. The belly binder should be applied if there be diarrhœa.

Severe cases.—If the child be really ill with the complaint he must be kept in one room or in bed, with the room warmed to 65° F., as in the treatment of fevers. Bronchitis and pulmonary complications (q. v.) require supporting treatment. A simple mustard emetic is of much value in clearing the tubes. The diarrhœa with slimy ejecta is best treated with small doses (half-a-teaspoonful) of castor oil and fruit, sugars, and farinaceous articles as leading to the

generation of acid products, are to be avoided as far as possible.

Liniments of turpentine and acetic acid may be rubbed into the chest and throat when the coughing is troublesome and bronchitis is present. Warm linseed tea or barley water with a little liquorice, to *promote perspiration*, is also good, and tends to relieve the spasm and diminish the frequency of the attacks of coughing. Doubtless the paroxysms are more frequent and severe when the blood is not thoroughly depurated by the kidneys, and warm drinks appear to promote the excretion of impurities from the blood. From this standpoint the action of the bowels should be regulated. For the bronchitis or simple catarrh I generally order ipecacuanha with or without ammonic carbonate. The ammonic acetate is preferable when the cough is hard and not loose.

℞ V. Ipecac., ♏iii.
Am. Carb., gr. ii.
Glyc., ♏x.
Aq., ʒii.

for a child two years old, three or four times a day.

To diminish the number and severity of the attacks I use the bronchitis kettle three or four times a day. A teacupful of 1 in 20 carbolic acid and four teacupfuls or less of water (if more carbolic is wanted) placed in the kettle and boiled. The children sit near the spout and breathe the steam. This is very useful in my experience, which has been very large. It probably acts as an anæsthetic to the larynx, nose, and throat. It is probably beneficial also to the mucous membrane itself. Dr. Sansom regards this as perfectly useless, but recommends Calvert's domestic carbolic vaporiser, or Savory and Moore's vaporiser. The liniment, ipecacuanha, and carbolic spray form my general treatment, and in the majority of cases nothing further is required during the catarrhal stage of the disease. At its decline I generally prescribe

℞ Ext. Cinch. Liq., ♏iii.
Glycerine, ♏x.
Syr. Aurantii, ♏x.
Decoc. Cinch., ad ʒii.

for a child two years old.

The hooping or paroxysmal stage may be prolonged and obstinate; then I prescribe belladonna and hydrocyanic acid and bromide of potassium—all with a view to relieve the *nervous distress* and diminish the severity and frequency of the paroxysms. I use them separately, not together.

℞ Tinct. Bellad., ♏x.
Aq., ʒi. t.d.s.

℞ Acid. Hydrocy. dil., ♏½ or ♏i.
Glyc., ♏x.
Aq., ʒii. t d.s.

℞ Am. Brom. gr. iii.
Syr. Aurantii, ♏x.
Spt. Am. Arom., ♏iii.
Aq. Chlorof., ʒii. t.d.s.

Each for a child two years old.

I have seen at least a hundred frænal ulcers in hooping cough. Not one required special treatment.

The *paroxysm* of hooping cough should be regarded as a genuine, limited, local reflex bulbar epilepsy, attended with violent cortical discharges, which may occasionally lead to total unconsciousness, but always entail a certain amount of mental distress, fright, or terror, with coincident loss of intelligence.

Sometimes the *vomiting* that follows the hooping paroxysm proves serious from the starvation and sequent wasting. This should be met by giving the food every hour, if necessary, in small doses of ʒi. or ʒii., iced or cold. The food should be very nutritious: animal soups or vegetable

soups, thickened with Mellin's food; milk and barley water; raw meat juice, sweetened and iced; small doses of wine or brandy, or champagne; or, if it can be taken, pounded chicken or meat. A peptone suppository (Savory and Moore) put into the rectum every four hours is good in severe cases.

The tendency to vomit is sometimes checked by minute doses of ipecacuanha wine frequently given or by large doses of bromide; and oxalate of cerium has been commended, gr. i. frequently.

I seldom find it necessary to go outside the circle of remedies above mentioned. At the decline of the case there is nothing that equals a change of air to the country (dry inland or seaside); a little iron and quinine, with good diet, with attention to the stools in judging of the food; and protection of the surface of the feet, neck, chest, belly, as well as of the limbs, to prevent catarrh. Friction along the spine is said to be of special value.

I shall now give under appropriate headings various remedies that have been used in hooping cough:—

I.—Drugs that soothe and depress the *reflex nervous apparatus*. This is their chief action.

Opium wine or tincture in drop doses during the paroxysmal period; the effects carefully watched; useful in some cases.

Narceine has been prescribed with syrup and water in centigramme doses, repeated as may be necessary. It acts like morphia.

Inhalations of *chloroform* and *ether* to lessen each paroxysm.

Tincture of *lobelia*, ten minims, every hour to a child two years old (Ringer).

Zinci valerianatis gr. i. every four hours (watching effects), child two years old.

Alkalies.—Carbonate of potash gr. ii., syrup ℥xv., Aq. ʒi.; four times a day, child two years old.

A wine glassful of infusion of *clover*, made of two ounces of carefully-dried red blossoms, steeped in a pint of boiling water for four hours, child two years old.

Succus conii in ʒss. doses, three or four times a day, child two years old. Sometimes useful when sleep is much disturbed.

Five minims of *liq. ext. of ergot*, t.d.s., child two years old, I believe to be valueless.

Tinct. *Sumbul* ♏x., t.d.s. Same age.

Mixtures of antispasmodics—

Tinct. Belladonna, ♏iii.
Tinct. Valerian, ♏i.
Tinct. Digitalis, ♏i.

two or three times a day, for a child one year old. Gradually increased, and its effects watched.

Chloride of gold and sodium gr. $\frac{1}{10}$, given every two hours. An effect said to be produced in a few hours.

Croton chloral one grain every four hours—child one year old—alone or combined with belladonna ♏v. or tinct. of cardamoms ♏v. Two grains for a child ten years old.

Quinine in large doses, gr. ii. or iii., t.d.s., for a child two years old.

Benzol ♏v. in syrup ʒss. and water ʒi., t.d.s.; objectionable on account of paraffin taste; two years old. Sometimes succeeds.

Carbolic acid gr. $\frac{1}{2}$, or creasote ♏i., t.d.s., in mucilage and syrup. Some give more. Two years old. Not good.

Succus hyoscyami ♏xx., t.d.s. Two years old. Perhaps of equal value with succus conii.

Extract of cannabis indica 7 grains, extract of belladonna 3½ grains, alcohol and glycerine aa. ʒi. Five drops of this for a child one year old. Repeated as may be necessary (Vetlesen). Deserves a trial in obstinate cases.

II.—Drugs that act on the *larynx*, *pharynx*, and *fauces*.

Anæsthetic, astringent, and *antiseptic* (usually all three).

Alum one grain every hour in ten drops of glycerine and water ʒi.; during the final stages, when there is no complication. Two to six grains less frequently may be prescribed with honey. Many authorities aver it is useful in all stages. The topical effect is aided by the glycerine.

Silver nitrate (gr. xx. to ℥i. of distilled water) applied by swabbing or brush to the larynx and parts around. It may be sprayed with steam (gr. xxx. to ʒi.). Two or three times a day. I have seen these used with good results.

Glycerine of tannin and glycerine of iron (equal parts of iron perchloride and glycerine), applied by brush or swabbing with mop. Four or five times a day.

Drinking freely of lime water is of but little value.

Gargles of various astringents—alum, tannin (gr. x. to ʒi. each); raspberry vinegar—sometimes useful.

Anæsthetic.—Hydrochlorate of *cocaine* four per cent. should be applied cautiously, locally, two or three times a day; the brush should not be over-charged.

It may be sprayed into the throat and nose by Siegle's apparatus. This agent should be used with considerable caution, especially in infants, for fear of toxic effects. Chloral is said to relieve the toxic symptoms.

Antiseptic killing the germs the alleged causes of the complaint.—One-per-cent. solution of resorcine applied by means of brush to all parts of the nose and throat, every two hours, night and day. Sprays of two-per-cent. solution also are used.

Turpentine, eucalyptol or *thymol* ʒi. to ʒiii. of spirits and ℥vii. of water. By inhalation of the vapour. These should be vaporized from a clay or metal basin. The vapor cones of the North Hants Co. may be used. The vaporization should be practised in a small chamber in which the child should sit.

III.—Drugs that act on the **nasal** mucous membrane,

either simply anæsthetic or astringent, and, if the latter, antiseptic. Powders may be insufflated several times a day. A simple insufflator may be formed of a narrow piece of pipette tubing. These drugs are used on the theories that the disease (1) starts in the nose, (2) is due to germs, (3) the paroxysms are caused by reflex action from the nose.

Powders.—Finely powdered *boric acid* and finely triturated roast coffee, equal parts; *quinine sulphate;* powdered benzoin; *salicylic acid;* bromide of potassium. *Iodoform:* tannin; bicarbonate of soda; carbonate of lime. The quinine may be mixed with these in various proportions. Those in italics are the most useful; they must be repeatedly used—some say every hour. Such believe that hooping cough at the outset is a reflex nasal neurosis.

Inhalation of vapor.—Nose and mouth inhaler of perforated zinc (Maw's) with cotton wool on which 15 to 20 drops of carbolic acid are sprinkled. It may be used two or three times a day for an hour each time. Be on the outlook for carbolic poisoning.

Syringed into nostrils.—Antiseptic: Salicylic acid 1 in 1,000, or corrosive sublimate 1 in 5,000. Two or more times in the night or during the day.

Anæsthetic.—Two-per-cent. solution of *cocaine* applied by the brush. It may be used by soaking a piece of antiseptic wool in the four-per-cent. solution, and placing this in the nostril.

IV.—Drugs that act on the *bronchial mucous membrane.*

Senega (stimulant expectorant) instead of ipecacuanha, ʒii. of the infusion every three hours or ♏xv. of the tincture. It should not be used with acute febrile bronchitis, or when the stomach is irritable.

Trochisques Vichot—a French pastille—(Roberts, 76, New Bond Street). Fumigation is practised under a tent bed; one burnt twice a day; each lasts about an hour (Goodhart).

Stockholm tar burnt by putting a red hot poker into it; the child is to breathe the vapours.

The air around *gas works*.

It is doubtful whether these last three act purely locally or after being absorbed.

General disinfection.—Said to be an instantaneous cure for hooping cough by M. Mohn. The affected child or children are suitably clothed in bran-new articles of dress and sent away to another part of the town. The bedchamber and living-rooms are then arranged for sulphurous acid fumigation. Everything that cannot be washed is left in the rooms to be sulphurized—the bedding, the toys, the clothes, &c. About an ounce of sulphur for every cubic metre of space is the quantity of sulphur to be burnt. The room is left sealed for five hours; then freely exposed to the atmosphere. After thorough ventilation the children are allowed to return and sleep in the disinfected apartments.

MEASLES.

Although measles spreads with the greatest rapidity from one child to another, still isolation should be practised. Quarantine should be begun at the catarrhal onset. We have to wait about a fortnight before we know whether other children will take the disease or not. A child who has had measles should not be considered free from infection till 20 days after the appearance of the rash have passed by.

The diagnosis of measles is not usually difficult; it has been confounded with scarlet fever, German measles, small-pox, simple catarrh, and simple roseola. A little attention to the history, and to the appearances at the time of illness, should prevent error; but error may occasionally be permissible. The coryza with injection of conjunctiva and high fever may be caused by simple catarrh; and if there be no measles in the neighbourhood the diagnosis cannot be

established till the fourth day has passed. The palatal hyperæmia—rash in the throat—is not of decided diagnostic value. The measles rash is said always to come out first in the palate and fauces. The rash comes out first, at the roots of the hairs of the forehead but the face may all be involved when the child is first seen; its mulberry tint and papular form are generally decisive, though the papules may suggest small-pox; but the temperature goes rapidly down with variola, whilst it usually rises further with the appearance of the measles rash; and the papules of true variola rapidly vesiculate and umbilicate.

It should be remembered that measles sometimes takes on anomalous modes of appearance; but the rash is rarely delayed, and the head, though usually, is not always the first seat of the eruption. As to roseola there may be a mistake about the rash, but catarrh and fever are absent in it. Rötheln causes some soreness of throat and redness of conjunctiva, but enlargement of the glands behind the sterno-mastoid and in the post-cervical region generally affords a diagnostic indication, as also the subsidence and reappearance, on the fourth or fifth day, of the sore throat. But it is permissible to confound mild measles with rötheln, unless there be a distinct epidemic of the latter disease at the time and in the neighbourhood. An uncomplicated case of measles requires but little special **treatment**. The patient, if treated at home, should occupy the top-floor, and have a large, airy room free from draughts and free from superfluous furniture (see general instructions for Treatment of Fevers). He should be in bed whilst the rash is out. The *complications* of measles require care and attention: Bronchitis and catarrhal pneumonia, diarrhœa, laryngitis, otitis and ophthalmia, convulsions, epistaxis. For the treatment of these complications, consult the articles on these different diseases. Much fever a few days after the rash has come out

usually means some chest complication. The *sequelæ* of measles are diarrhœa, large bronchial and tracheal glands, gangrenous stomatitis, diphtheria (often fatal) and noma vulvæ. Tubercle and hooping cough frequently follow. The knowledge of the tendency to catarrh of all the mucous membranes should prove a warning against the employment of irritants, especially purgatives, and should constitute a plea for protection by suitable clothing of the corporeal surfaces. The diarrhœa of measles is usually of the simple catarrhal form, but apt to degenerate into the dysenteric variety. If there be photophobia the room should be darkened. The sponging of the surface of the body is useful to relieve itching and to keep the mouths of the glands free from obstruction.

Convalescence.—The child may get up, if there be no complications, as soon as all fever has subsided. It should not leave the room till one week after the disappearance of fever. It should not leave the house for three weeks. Every care should be exercised to prevent chilling of the surface during convalescence, for some of the most obstinate chronic diarrhœas and lung catarrhs may be easily induced. Hence the greatest caution is required with the feeding during this period. It is the old story of children's dietetics—the avoidance of excess of fermenting substances, starches, sugars. A convalescent stomach, pancreas and duodenum must be fed with small quantities and not too frequently, so as not to tax their still small powers. Bathing, cold douching, and clothing are considerations needing all the attention described elsewhere. Good sea air or a dry inland climate, with tonics of nitric acid and infusion of cinchona, may round off the treatment. The scrofulous child after passing through measles should take cod-liver oil, with steel wine if anæmia be present. Sea air is best for them. Cod-liver oil should not be given if there be vomiting or diarrhœa.

Remedies for the cough of measles.—All coughs may be increased in severity and frequency by a disordered stomach, by bad feeding, deranged bowels, and by an impure atmosphere and blood. The treatment of a cough should not be purely local. The chief cause of cough may be laryngeal or tracheal; but there may be other aiding and abetting causes.

Internally.—Sedative: Tinct. Camph. Co. ♏x., every four hours for a child two years old. Dover's powder, chlorodyne and bromides are also used.

Expectorants.

℞ V. Ipecac. ♏vi., or Aceti Scillæ ♏v., or Oxymel Scillæ ♏v.
Glycerini, ♏v.
Spt. Æth. Nit., ♏vi.
Aq., ʒii., t.d.s. for a child two years old.

The squills should be used if the cough is loose, the ipecacuanha if the cough is hard. Inhalations of iodine and tincture of benzoin are useful for the hoarse, hollow cough which is sometimes associated with the bronchitis—a dram of either tincture to the pint of boiling water. Aconite and veratria have been employed in minim doses when the bronchitis is severe, but they must be used with the utmost caution.

Local applications to throat and larynx by mop or brush. Glycerine of tannin, boracic acid, carbolic acid, or simple glycerine. These tend to prevent the formation of membrane.

External applications to neck.—As sore throat and laryngeal catarrh are relieved by frequently renewed wet compresses under oil silk.

If the cough be croupy or attended with stridor, hot fomentations, or a sponge dipped in very hot water and suddenly applied are good.

Balneology and inunctions; the indications and objects are pretty much the same as for scarlet fever (p. 496).

A cold affusion to the head is valuable at the commencement of measles if there be much stupor or a tendency to convulsions.

The temperature should not be allowed to go beyond 102°. Tepid sponging will easily reduce it two or three degrees.

This and a cold wet pack may bring sleep, allay itching, and reduce temperature, or cause the evolution of a receding rash. Sudden retrocession of the rash may also be treated by a mustard bath. This is best if the pulse is failing.

For the treatment of hyperpyrexia, which is rare, see p. 486.

Ophthalmia.—The eye should be shaded from light; thoroughly syringed with warm water, or the water may be run into the conjunctival sac from a clean mop of salicylic wool. Biborate of soda gr. x. to ʒi. may be used three times a day mixed with an equal part of warm water. The margins of the lids should be greased with a weak yellow ointment of mercury.

Any antiseptic wash will do for the cleansing above mentioned.

Diet and stimulants.—Nothing special. Plenty of bland fluids, such as barley water flavoured with aniseed and sweetened with sugar; milk and barley water, boiled entire wheaten flour or Mellin's food, with broth, blanc mange and jelly, may be given whilst the fever lasts.

If *diarrhœa* supervene, milk and solids may have to be withheld. And light broths, whey, or barley water may be given cold for a day or so. Excess of food of any kind should be avoided, but saccharine and farinaceous articles more particularly. The diet should be regulated as described under Diarrhœa or Severe Diarrhœa.

Severe diarrhœa.—(See p. 323). A mustard leaf for ten minutes, then hot fomentations, frequently changed; or

cold wet compresses to cover the whole surface of the abdomen and changed every few hours. The cold compress is best for children; hot applications for infants. The belly should be swathed in flannel or cotton wadding, placed over the application.

The bowels should be opened by a small dose of castor oil, and then the Mist. Ol. Ric. c. Opio used regularly. Stimulants of brandy in doses of a few drops may be required.

Dilute sulphuric acid and opium, small doses of rhubarb and soda mixture, ipecacuanha and fluid magnesia in small doses are sometimes suitable remedies for checking the diarrhœa of measles.

Brandy or other stimulant may be required for the complications. The signs suggesting stimulants are the same as usual: rapid feeble pulse, drying tongue, muttering brain, great sweating.

To prevent *exhaustion* or adynamia in severe bronchopneumonia with an over-taxed right heart, stimulation is necessary: Ammonia, brandy, wine; digitalis, &c., see p. 185.

Carbonate of Ammonia, gr. ii., for a child two years old, in milk. It should be given every three hours if there be much exhaustion. Sal Volatile, ℥x., for a child two years old, in syrup and water. Tinct. Digitalis, ℥ii., for a child two years old, in glyc. and water.

Otorrhœa is treated on the same antiseptic principles and methods as for scarlet fever. Its dangers are indicated at p. 461.

Antipyretics.—Quinine in fair sized doses, gr. v. for a child three years old, is good; but the bath, or pack, or sponging should be preferred. Some give quinine in small doses frequently.

Malignant measles with a badly developed rash is best treated by the hot mustard bath. There is usually an

association of deep congestion of the internal viscera with a tendency to severe bronchitis, atelectasis, and broncho-pneumonia. In such cases abstraction of blood by many leeches (six or eight) over the heart may be needed; but free stimulation by brandy and watery purgation by compound jalap powder is good treatment.

Sometimes the pulmonary complications are alarming after the rash has been out and is fading. Venæsection should not then be practised in children under the age of seven, unless the hot bath with mustard and mustard poultices, dry cupping and free stimulation have been first tried. Reaction from this collapse should be our aim, and the removal of much blood might frustrate our object.

RÖTHELN, OR GERMAN MEASLES.

If a child take rötheln from another, about one week must elapse before the disease appears. There is nothing but tepid sponging to be done for the itching papular rash. The subjective sensations accompanying injection of the conjunctivæ may be relieved by darkening the room, as in measles. The desquamation of the skin is no more but even less than that of measles, and calls only for a warm bath every day to assist the removal of the cuticle. Neither the fever nor the cough need special attention. But the sore throat may relapse, and be attended with much viscid secretion about the fauces, which is best treated by gargling with warm chlorate of potash solution ʒi. and glycerine ʒii. to a pint of water, or in younger children mopping out the parts with a sponge mounted in a sponge-holder, or with lint wrapped round a penholder. The enlargement of the glands usually subsides in due course, but if not their reduction is aided by wet compresses or painting the skin over them daily with tincture of iodine. To relieve constipation a saline purge is best —Carlsbad, Eno's salts or fluid magnesia. The *diagnosis*

has to be made from measles by the smaller size of the papules, their non-crescentic arrangement, the swelling of the post cervical glands, the less fever and the appearance of the rash within a day of the feeling of malaise, if there be such.

VACCINATION.

Any infant that is suffering from skin eruptions or is seriously debilitated, or, indeed, who is out of health in any way, should not be vaccinated. For the vaccination may not only aggravate existing disease, but may itself fail, or a futile attempt may even render the organism insusceptible of proper vaccination. Vaccination with the human virus is best, done in five places on the left arm, above the level of the insertion of the deltoid. Virus immediately collected on the lancet from the seventh-day vesicle of another healthy child should be used. But dried virus on ivory points or virus kept in Husband's capillary tubes may have to be employed. The virus must come from a transparent vesicle, and blood must be absent from the vesicle, and must not be drawn in collecting the virus. A successful vaccination evolves in the following order: A papule at the end of the second day, and a vesicle at the end of the fifth day, then the vesicle extends in area till the eighth day, when it should still be full of clear lymph. As the contents become turbid about the tenth day, a red areola forms around the vesicle, and the base of the vesicle becomes indurated. Gradually the pustule thus formed subsides, and a scab is formed by about the fifteenth day. The depressed circular scar after detachment of the scab is seen on the twenty-first day. This order is the rule, but sometimes the succession of phenomena is delayed and sometimes accelerated. Delay is natural when calf lymph is used, or when the vaccination is performed during the incubation period of acute specific fevers. Acceleration is usual when revaccination is per-

formed. The only **treatment** of vaccinia is to protect the arm and its sores from irritation and dirt. This in infants cannot be effected by the employment of mechanical apparatus. The fever attendant on the vaccinia is generally slight and seldoms calls for bathing or sponging. A dose of castor oil if the tongue be furred, or the bowels constipated, or the child restless, is all that is usually required. The erythema that frequently attends the vaccinia may spread widely, but does not need anything more than a weak lotion of carbolic acid, one in a hundred, or Liq. Carbon. Deterg. ʒi. to ℥vi. to relieve the itching. Erysipelas rarely developes, but a few vesicles may stud the erythematous surface. The glands in the axilla being tender require that the arm be kept quiet and free from knocks or movement. After vaccination with calf lymph, I have frequently seen enormous enlargement of the axillary glands, which I treated by hot fomentations and glycerine of belladonna paint. Occasionally actual abscesses form. I have also once seen paralysis of the extensors of the forearm result from this enlargement. It subsided slowly. Faradic reaction of the muscles was diminished, but never abolished. Vaccinial vesicles may be found on the face, buttocks, and other parts, as the result of accidental inoculation. Sometimes the erythema is of erysipelatoid character, and this may be widespread and migrating in its character. Ringer strongly recommends aconite, given in the usual doses, for this inflammation. Belladonna paintings should also be employed twice daily. The parts should be covered with cotton wool and a bandage.

SMALL-POX.

The mortality of small-pox in children under five years of age is extremely high.

The disease may have to be distinguished from measles, scarlatina, and possibly varicella.

Measles may be confounded with small-pox, for there is in both a period of fever preceding the eruption, injection of the conjunctivæ, and a dusky papular rash on the face. But severe vomiting, high fever, and loss of control over sphincters are more common with small-pox than measles or scarlet fever. And cerebral symptoms, which usually partake of the character of stupor and convulsions, are more marked and more frequent in variola. A scarlatiniform rash sometimes attends the pre-eruptive stage of small-pox, and lends a spurious likeness to scarlatina, but the rash is usually less scarlet, less extensive, and less punctiform. In contradistinction to measles, the appearance of the eruption in variola is attended with a lull in the symptoms, and a decided fall in temperature. The period of incubation is twelve days.

The **treatment** of small-pox is many-sided. At the outset the diagnosis is the treament. The wet pack may be used should the rash recede. Isolation must be practised with promptness. The room must be very large and very airy. We must sail as near to the wind of catching cold as we dare. For the presence of abundance of fresh air decidedly diminishes the risks from suppuration of the pocks. It is true that fresh air and light promote the maturation of the individual pocks, but the actual number and intensity of these is diminished by a free supply of cool air. The tem perature of the room may with advantage fall below 50°.

The pocks require treatment on the second day after their appearance; they should be protected by flexible collodion or traumaticine, and the room should be darkened. Some recommend the application of solid nitrate of silver to each pock; others, covering the pocks with mercurial plaister, or scme other material. The principle is to protect them from the action of light and air; nitrate of silver does this by forming an insoluble albuminate. A solution of this salt, gr. xx. to ʒi., may be simply painted on the pocks, or some

advise the pocks to be pricked with a needle dipped in this solution.

Later on the irritation of the eruption demands treatment. The child's hands should be muffled, and the eruption anointed with sweet oil, spermaceti ointment, or cold cream.

The *eyes* may suffer considerably. If there be mere conjunctivitis, frequent bathing by dripping warm water from a sponge should be practised; the conjunctival sac should be cleaned, and a solution of nitrate of silver gr. i. to ʒi., or sulphate of zinc gr. iii. to ʒi. be run in or syringed in. Then anoint the margins of the lids with castor oil or sweet oil. The eyes may require treatment every few hours, according to the amount of the discharge. If the inflammation be severe, a strong solution of nitrate of silver gr. x. to ʒi. may be brushed once over the inner surface of each eyelid, and immediately after warm water should be run over them. Corneal ulcers may form, and the iris may become inflamed; for the first the treatment consists in the use of the solid stick of nitrate of silver, and for the second a lotion of atropine (see "Nettleship on Diseases of the Eye").

The *fauces* and neighbourhood may require gargles, if the child be old enough to use them. Or the practitioner may have to syringe out the mouth and remove accumulations of mucus. Boracic Acid ʒi., Potass. Chlor. ʒi., and Glyc. ʒi., to half-a-pint of water is a useful lotion. Hot fomentations or poultices may be used externally; and also for hoarseness or loss of voice, which is a sign of the presence of pocks in the larynx. The steam spray with carbolic acid (one part of one in twenty carbolic acid to four parts of water), or burning vapour cones of carbolic acid and camphor may be employed under the cover of a tent-bed. But the complication is a serious one, and may call for tracheotomy; though the case usually ends fatally.

There is danger at three chief times in the course of severe

small-pox. For the rapid supervention during the *early* stage of coma and convulsions, nothing effective can be done except free bleeding, but this could only be done on trial, and to appease the parents. Such cases are said to be always fatal. Collapse at this period must be treated by hot mustard baths and the administration of brandy and ammonia, and even the subcutaneous injection of ten drops of ether.

But collapse may set in suddenly during the *second* or *third* day of the process of maturation of the pocks. This is heralded by increased restlessness, and soon followed by sudden subsidence of the swelling of the hands and face, and by the appearance of pallor of the skin in between the pustules. Moreover, the vesicles or pustules share in the general collapse, and often sink down themselves. Here the demand for stimulants and nourishment is of the greatest urgency—brandy or wine, or champagne, beef tea thickened with Mellin's food, and meat essences. Another critical time is about the *fifth* day of the eruption and the eighth day of the disease; the call is less sudden, the danger is more from sheer asthenia than actual collapse, but the remedy is the same—free stimulation and nourishment.

The thirst of small-pox should be relieved by lemon-flavoured barley water or other mucilaginous drinks, which will also relieve the distress occasioned by the sore throat. The bowels, of course, need attention, but require no special treatment. A tea-spoonful of castor oil to open them, or a few drops of the oil in mucilage, with a drop of laudanum should they be too open, will suffice. Restlessness and sleeplessness usually indicate a need for stimulants and food, or attention to the skin which is causing irritation. But a little opium is frequently beneficial even for children. A few drops of chlorodyne (mv. for a child five years old) induces sleep and promotes a healthier state of the cerebral cortex.

The formation of abscesses should be followed by their

speedy evacuation, and by an increase in the nourishment. Hæmorrhage into the pocks is an indication for further stimulation and nourishment. It is not of so serious an import as when in the early period, hæmorrhages occur into the skin, from the bowel, along with the urine or from the nose. These hæmorrhages are usually attended with rapid collapse; the hot bath is the only means of treatment, but it is not likely to do much good.

Cleanliness is of the utmost importance during the whole course of the eruption; the linen of the body and of the bed should be frequently renewed, and the body should be washed every day by sponging with tepid water. The nostrils must never be allowed to be occluded by scabs; the scabs must be removed and the raw surface beneath treated with antiseptic and soothing remedies. A weak solution of carbolic acid or carbolic oil is as good as anything, or this may be alternated with zinc ointment if there be any fear of absorption of the phenol. Scabs anywhere, but especially in the scalp, should not be allowed to remain, but removed, and the sore beneath cleansed and anointed with an ointment of diachylon or dressed with a wet dressing of red lotion if the granulations be indolent.

℞ Lotio Rubra.
Sulphate of Zinc, 2 grains.
Comp. Tinct. of Lavender, 12 minims.
Water, ℥i.

℞ Ung. Diachyli.
Litharge, 3 parts.
Olive Oil, 4 parts.
Lard, 2 parts.
Yellow Wax, 1 part.
Eucalyptol, 1 part.

The *bronchitis* that may attend small-pox may be ex

by the presence of pocks on the bronchial mucous membrane. If this be severe, the usual remedies for bronchitis may be employed, but not those belonging to the depressant class. Indeed, free stimulation with brandy and ammonia and the use of the carbolic steam spray will be better than giving special expectorants.

During *convalescence*, the seaside, cod-liver oil, and iron are to be recommended, and all the more so if the child have developed pulmonary complications or be of consumptive stock.

CHICKEN-POX.

It is ordinarily said that varicella requires no treatment. This is not strictly true. The intolerable itching of the developing vesicles may be allayed by sponging with rather hot water, care being taken not to break the vesicle. Scratching and picking must not be allowed. It does not often occur, but every practitioner should bear in mind that the rapidly formed vesicles of varicella may take on an ulcerative or gangrenous character, and lead to a fatal issue through hæmorrhage, pyæmia or exhaustion. If, therefore, the child be weakly and ill-nourished, a supporting plan of treatment is most necessary, but the malignant varicella is occasionally found in healthy children. In most necropsies of such cases tubercles are found in the internal organs.

Mistakes are made in practice in the differential diagnosis of varioloid and varicella. It should not be forgotten that ulcers, resulting from vesicles, occur not only in small-pox, but also in varicella, on the mucous membrane of the mouth, fauces, soft palate, and pharynx. The eruption often appears first on the palate and fauces. Moreover, light does not aid the maturation of varicella, for the scalp is the frequent seat of vesicles. There is no true umbilication in the vesicle of varicella.

Abortive varicella or vesicles may be papular; and papules

may be nearly but not quite vesicles. I think it practically useless to speak of varicella prurigo, or, indeed, of persisting or relapsing varicella.

The **modified** small-pox eruption is usually preceded for three days by severe symptoms—fever, pain in the small of the back and vomiting. The onset of varicella is far less severe, and the eruption appears as small, not shotty papules that usually vesiculate within six hours. Successive crops of vesicles appear for several days together. The disease lasts about ten days. The patients must not mix with other children. Two weeks should elapse before the practitioner can say that others have not taken the complaint. No medicines are required ordinarily. The fever hardly needs notice, though the temperature must always be taken; at the end of the disease the temperature of the body has a tendency to be lower than natural.

After the complaint has disappeared a change of air to the seaside may be recommended, especially if the patient come of a scrofulous stock. A few minims of the fluid extract and ʒii. of infusion of cinchona with some glycerine t.d.s. is the best tonic.

Ointments may be used to prevent itching and remove scabs: vaseline, zinc ointment, &c.

A few grains of citrate of potash, or small doses of liquor ammoniæ acetatis, or bitartrate imperial (bitartrate of potash ʒii. to Oi. water sweetened with sugar and cinnamon water) may be given as a diaphoretic and diuretic, and the last may perhaps open the bowels. A little jalapine, gr. ii. in a pillule or a dose of fluid magnesia sweetened with syrup of orange, may be given as an aperient.

EPIDEMIC CEREBRO-SPINAL MENINGITIS.

This is a rare disease in this country; but young males are prone to be affected. It is a meningitis of sudden onset.

Its chief symptoms are retraction of the head, severe headache, vomiting, slow pulse, but liable to sudden variations, tetanic spasms of the whole body, local spasms of the face and neck, either of a discontinuous (clonic) or continuous (tonic) character, and local paralyses. In some epidemics purpuric blotches appear in the skin of the trunk and limbs. Experimental irritation of the pons Varolii has caused general purpura. Herpes about the lips and face is a frequent eruption. The temperature is usually low.

It can hardly be mistaken for any other affection. Tubercular and simple meningitis are causes of retraction of the head, but seldom begin as abruptly as the simple epidemic cerebro-spinal meningitis. Otitis sometimes has a likeness to cerebro-spinal meningitis, and retraction of the head may be marked with it; but otorrhœa is usually attended with complete relief; the crying of otitis is very continuous (see p. 461).

Of the **treatment** of epidemic cerebro-spinal meningitis I know nothing personally. Faulty hygiene should be remedied. Hypodermic injections of morphia, $\frac{1}{10}$ grain for a boy ten years old, repeated if necessary; large doses of bromide of potassium, gr. x. three times a day; chloral hydrate, gr. ii. every four hours, carefully watched for signs of coldness of surface and depression of heart; leeches behind the ears; spinal ice bag; hot fomentations to back of neck —have been recommended. Any persistent paralysis, should recovery ensue, may be treated by moderate doses of iodide of potassium with a view to promoting absorption of the products of exudation. The instructions given at p. 459 may also prove valuable.

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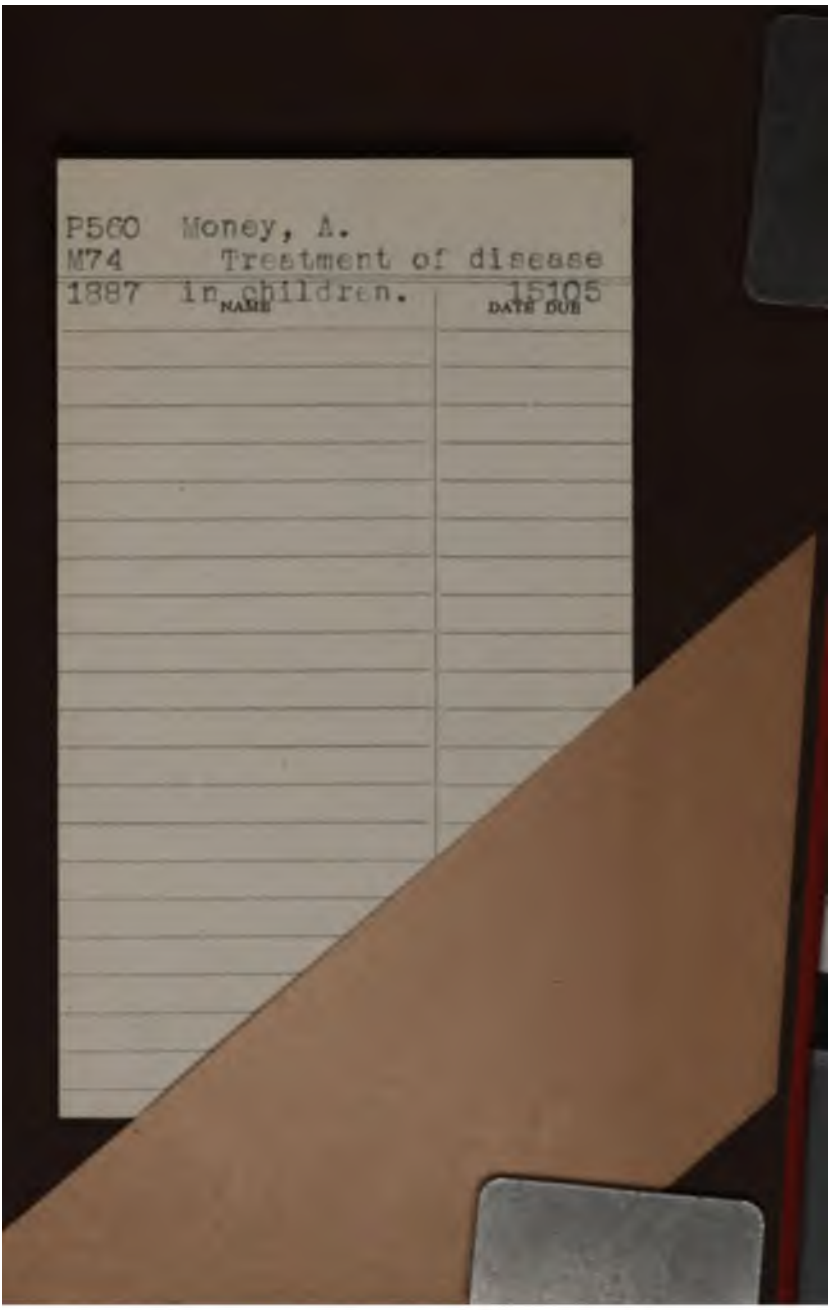
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